

This month...

- PhytoLux continues working closely with universities and research organisations
- The future is looking bright for LED plant growth lighting
- Tomato season extension achieved with Attis-7
- The endless summer



The latest news, views and industry information from the LED plant growth lighting specialists

PhytoLux continues working closely with universities and research organisations

We held our third seminar at the Rothamsted Research facility in Harpenden on 11th February 2015, the objective being to share knowledge with the nineteen universities and seven research organisations that have been trialling our Attis range of low energy LED plant growth lights. Thirty research scientists and horticulture delegates attended the seminar. We have been working in partnership with leading UK plant research institutions, universities and commercial growers since 2011 to develop a unique, generic lighting solution that will make it commercially viable for growers to either extend the growing season or grow throughout the winter months.

Key speakers at the seminar were Julian Franklin, Head of the Horticultural and Controlled Environment Department at Rothamsted Research, and Steve Edwards, Managing Director of PhytoLux. Julian has been working with PhytoLux for four years and was therefore able to give an authoritative view regarding the results achieved when using the PhytoLux growth lights for a significant number of crops grown at the facility. The key objective of the trials for Rothamsted Research has been to find a solution that will produce a similar or improved growth result than the High-Pressure Sodium (HPS) SON-T lights previously in use in their greenhouses. Julian was able to report to the group that energy savings in excess of seventy percent have been achieved and he provided evidence of this during a tour of the facility by showing the new energy monitoring devices that have recently been installed to the power supply of each greenhouse.



Steve Edwards presents the results from the successful trial at the University of Oxford

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A unique engineering approach...

For the past 4 years the key focus of the PhytoLux team has been the development of a suite of generic supplemental top lights that will result in winter growing becoming a commercially viable option. PhytoLux is not alone in this. With a number of credible LED plant growth lighting companies operating in the sector, the value of using this technology is now proven and becoming a solution of choice for the industry. With the unique engineering approach taken by PhytoLux we have been able to work closely with many commercial growers, universities and research institutions, at all times sharing our knowledge, to provide a high quality solution that ensures the best outcome for all involved. As a consequence, PhytoLux provides a solution that includes;

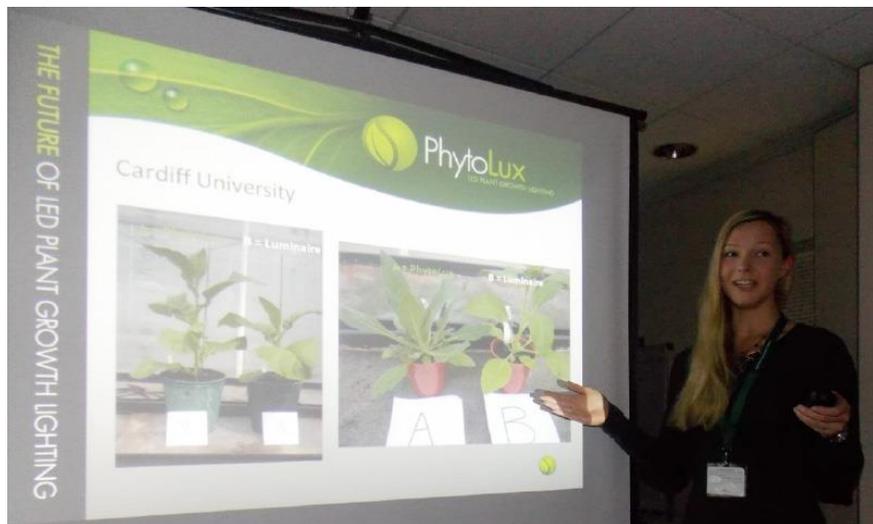
- **High quality, 'single bin' LED chips supplied by one of the world's leading chip manufacturers**
- **A patented passive thermal management system with an aluminium heat sink that doesn't require cooling fans**
- **Low maintenance and long life units**
- **Specific wavelength spectrums to provide an optimum, highly efficient and generic light source**
- **Knowledge transfer enabling optimisation for the end user**

If you would like to know more, please contact us on **0844 880 4763** or by email enquiries@phytolux.com so we can help you understand the potential of LED plant growth technology.



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Steve Edwards provided an overview of the numerous successful trials being undertaken and thanked the participants for their help and support saying that, "The hard work associated with delivering a long R&D programme is now starting to pay off. With the help of all organisations involved in this programme, we have been able to develop our products so that they can be used generically to deliver excellent growth results with many crops and a major decrease in power consumption versus traditional growth lighting. All year round growing in the UK will soon be on the increase." Steve continued, "We see ourselves as a solution provider and business partner rather than just a supplier, working with our customers to ensure best practice is shared for the good of everyone. The work undertaken through this programme has been a good example of this".



Laura McLean of PhytoLux presents the impressive results achieved with the trial at Cardiff University

Supporting Steve on the day was Laura McLean, who has been one of the key contacts with trial participants during the last twelve months. Laura shared the results achieved in a number of trials including;

- **University of Bristol:**
"Stockier, more compact plants with better developed leaves and an average energy saving of 71.4%"
- **Cardiff University:**
"Plants that are stockier and stronger with faster and denser inflorescence, better developed rooting systems and shorter intermodal spacing".
- **Moulton College:**
"More compact plant morphology, higher chlorophyll content, thicker and sturdier leaves, faster growth rate and higher dry weight, whilst maintaining root:shoot ratio".
- **University of Greenwich:**
"Plants propagated by tissue culture under the PhytoLux lights rooted faster with a greater number of roots and sturdier root systems"

Laura commented:

"Having so many experienced horticulturists and research scientists together in one room ensures that we are helping each other. The insights provided have played a vital part in helping us develop a product that works for the industry. 2015 is going to be an exciting year for all of us".

Tomato season extension achieved with PhytoLux Attis

On 1st October 2014, a Cambridgeshire grower commenced a trial to gain an understanding of the effect of PhytoLux's low energy LED growth lights on tomato plants versus traditional SON-T growth lights. The objective of the trial was to evaluate the benefit of using the Attis-7 to extend the growing season. The initial 'post-season trial' commenced in week 40 and ran for a period of 5 weeks.



After 5 weeks plant growth results were very positive...

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The future is looking bright for LED plant growth lighting

Low energy LED plant growth lights for use in horticultural research and commercial food production have been gaining traction in the industry for some time. Following extensive research and development over the past four years the clear benefits from using these lights have become recognised across the sector. There has been a real change in momentum during the past twelve months with some significant installations now demonstrating clear proof of the advantages of using LED lights for plant growth purposes.



We are at the forefront of this work within the UK. Managing Director, Steve Edwards, has taken a unique engineering approach in the design and development of the PhytoLux range of LED plant growth lights in order to offer a commercially viable, high light output and low energy consumption solution. This new technology means that many crops can be grown commercially all year round under glass, reducing the need for imports from countries with warmer climates and longer day length. By way of example, 475,000 metric tonnes of tomatoes are consumed each year in the UK but 80 per cent of these are imported. This highlights the opportunity for British growers to significantly reduce "food miles" at a time when 'sustainability' is high on the agenda.

While the benefits of the red and blue spectrum to plant growth are well known, we have included additional wavelengths in our spectrum and have been conducting broad spectrum LED trials with key universities and research institutions across the UK. These wide spectrum trials have shown that the speed of growth, flavour and colouration can all be improved in order to provide a better quality food product. The use of a broad spectrum LED that includes a wider range of light wavelengths is clearly proving to be the future direction for horticultural plant growth lighting.

"Our units are now in use with more than forty organisations in the UK ranging from universities, major research establishments and commercial growers", explains Steve. "We have seen some very impressive results in the past twelve months and are now considered the solution of choice by those we are working with within the industry".

Tomato season extension achieved with PhytoLux Attis

There was a major difference with the extent of ripened fruit being harvested, with those grown under the Attis-7 LED growth lights producing an average of 14.8 harvested fruit per truss versus only 8.4 for those grown under the SON-T's. Combined with the expected 65% energy saving from using the Attis-7, this was a very good outcome.

Having proven the value of using the Attis-7 at the end of the 2014 season, the trial will now be re-introduced in week 4 of 2015, with the objective of evaluating the effect of the Attis-7 at the start of the 2015 season and understanding the impact on overall annual yield. This will include the quantity, quality and brix level of marketable fruit and whether or not this exceeds that achieved through the traditional SON-T HPS lights.

PhytoLux place great value on the trials carried out by our industry partners, without which we would not have been able to develop our product range and deliver a commercially viable option for extending the growing season.

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As well as the unique engineering approach, Steve and the PhytoLux team seek to ensure that we provide a comprehensive programme of knowledge transfer within the industry, to ensure that the users of our lights understand the optimum processes for growing using this new technology.

"Whether it's an energy saving of up to 65 percent over traditional SON-T lights, or about achieving an extension to the growing season with higher yield volume, we have a solution that fits the requirements of most organisations" explains Steve. "We have seen a tomato crop yield match that of our client's Spanish operation throughout this winter and produce fully ripened strawberries for Christmas 2014, which is a significant achievement".



There are currently sixteen UK commercial growers that have already installed PhytoLux's supplemental top light units in their glasshouses, ranging from seed producers and propagators to commercial soft fruit, tomato, herb and bedding plant producers. Increase in crop yield and extension of the season have been key drivers for these organisations, alongside the need to maintain high quality produce. Within edibles the use of the broad spectrum PhytoLux LED units has also enabled improvement in flavour and colour.

"This is the beauty of LED", continues Steve. "We have developed a generic LED solution to provide a successful growth light for a wide variety of plant and crop species."

Within the university and research sector, our team are working with major institutions on significant plant physiological responses to light manipulation. The importance of this work in support of the food production industry is now beginning to be realised.

"We have just launched a project with a major UK herb grower and controlled environment engineering company to develop a fully enclosed vertical farming solution that has relevance to both the research and food production industries", explains Steve. "With the support of one of the UK's major retailers we hope to develop a working solution in 2015 that will significantly help advance scientific research, but also have a discernible impact on reducing 'food miles' and improving energy credentials for the industry."



The endless summer

LED lighting holds out the possibility of harvesting British summer crops such as strawberries in winter. How far are we from seeing commercial rollouts?



Strawberries and cream are a British summer staple, with more than 150 million punnets harvested during the hottest months of 2014, according to the British Summer Fruits Association. But what if we could enjoy home-grown British strawberries in the depths of winter, too? It is a prospect that is looking more and more likely thanks to the growing use of LED lights in food production to extend growing seasons and boost British crops.

PhytoLux is at the forefront of research and development of LED plant growth lighting for soft fruit, grown in the UK.

