The Background

Controlled Environment Agriculture (CEA) utilise precision environmental, irrigation and nutrient delivery processes to maximise the yield of crops grown in protected environments and enable cultivation in locations which otherwise would not support efficient plant growth.

Providing light to plants grown under CEA conditions is crucial to their development and through the use of coloured LED lighting crops can be encouraged to develop desirable characteristics in terms of biomass, vitamin content and taste.

The Challenge

Despite the advantages of LED lighting, the efficiency of LED luminaires raises questions regarding their use in sustainable CEA systems.

Furthermore, matching the LED colour spectrum and intensity to the crop type, growth phase and desired crop characteristic is often challenging due to the complex interactions between plant, light source and environment.

As such, there is the need to optimise the periods that LEDs are used and also the spectrum of light that they produce.

The Solution

To address this, Cultinova has collaborated with e-llume, a producer of high performance luminaires and the University of Essex to realise a smart LED lighting system that measures light spectrum and intensity at crop level and controls LED luminaires to ensure the right amount of light is applied to the crop at exactly the right time.

This unique system opens-up new opportunities for improving CEA crop production through the application of intelligent LED lighting, while reducing the amount of energy used by horticultural lighting systems.

HOW IT WORKS

- Full dynamic lighting spectrum control
- Maximise crop yield & reduce energy use
- Suitable for R&D and commercial operations