WAGENINGEN UR
For quality of life

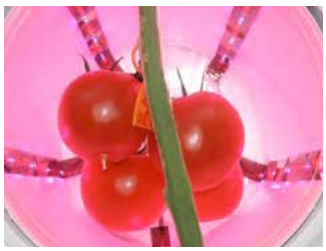
Innovation
& Demo Centre LED

LED

Innovation & Demonstration Centre for LED applications in horticulture

Wageningen UR Greenhouse Horticulture and Philips Lighting BV have recently joined forces in order to investigate and demonstrate the potential for LED applications in horticulture. The IDC LED is a facility in which various practical issues in the field of LED lighting can be examined in joint ventures. The new generation LEDs offers an increasing number of possibilities for greenhouse horticulture. This involves both light intensity and light quality.

PHILIPS



The facilities

Wageningen UR Greenhouse Horticulture in Bleiswijk has five glasshouse compartments (each 145 m^2) equipped with LED lighting for vegetables, flowers and potted plants:

- Combined Philips GreenPower LED interlighting and toplighting.
- Philips GreenPower LED toplighting.
- Two compartments with Hybrid Philips GreenPower LED interlighting and Philips HPS lighting.
- A compartment with 14 tables, each with individually controlled LED lighting:
  - spectrum (including deep red, blue, far red and white);
  - brightness (0-300 µmol/m^2/s);
  - exposure time (dynamic control);
  - position (distance to the plant).

For comparison, other glasshouse compartments are equipped with only HPS lighting. All compartments are equipped with very modern climate control, an extensive monitoring network of climate and plant sensors, multiple types of screens, humidification, heating, cooling, CO_2 dosage, diffuse or clear greenhouse glass and various water and nutrient applications.

Research at IDC LED

The purpose of the IDC LED is to investigate growers' research questions regarding LEDs. For example, whether or not the business efficiency can be improved by using a particular part of the spectrum. Thus, the possibilities for reducing energy use by 50% by using LEDs were investigated. In addition, studies are currently being performed if, and how crop development and quality can be improved with LEDs. The effects of the light spectrum are also being investigated on the susceptibility to disease, or levels of health-promoting substances such as vitamin C.

Results

Recent research with LEDs, has shown the following results

- 30% energy saving by the clever use of LEDs.
- The vitamin C content can be doubled by exposing tomato fruits to red light.
- Red light stimulates immune processes in the plant against fungal diseases.
- Light on axillary buds stimulates bud break.
- Red light increases the photosynthetic efficiency in rose plants, by 10% in green leaves and by 30% in red leaves.

Research and demonstration

The IDC LED is a unique facility for research on and demonstration of the potential of LED lighting for greenhouses.

Interested to use the facility? Please feel free to contact us.

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Wageningen UR Glastuinbouw
Violierenweg, 12665 MV Bleiswijk
E tom.dueck@wur.nl
T +31 (0)317 48 32 07
W www.wageningenUR.nl/glastuinbouw

Philips Horticulture LED Solutions
Esther de Beer
E e.sther.de.beer@philips.com
T +31 (0)6 27 219 291
W www.philips.com/horti