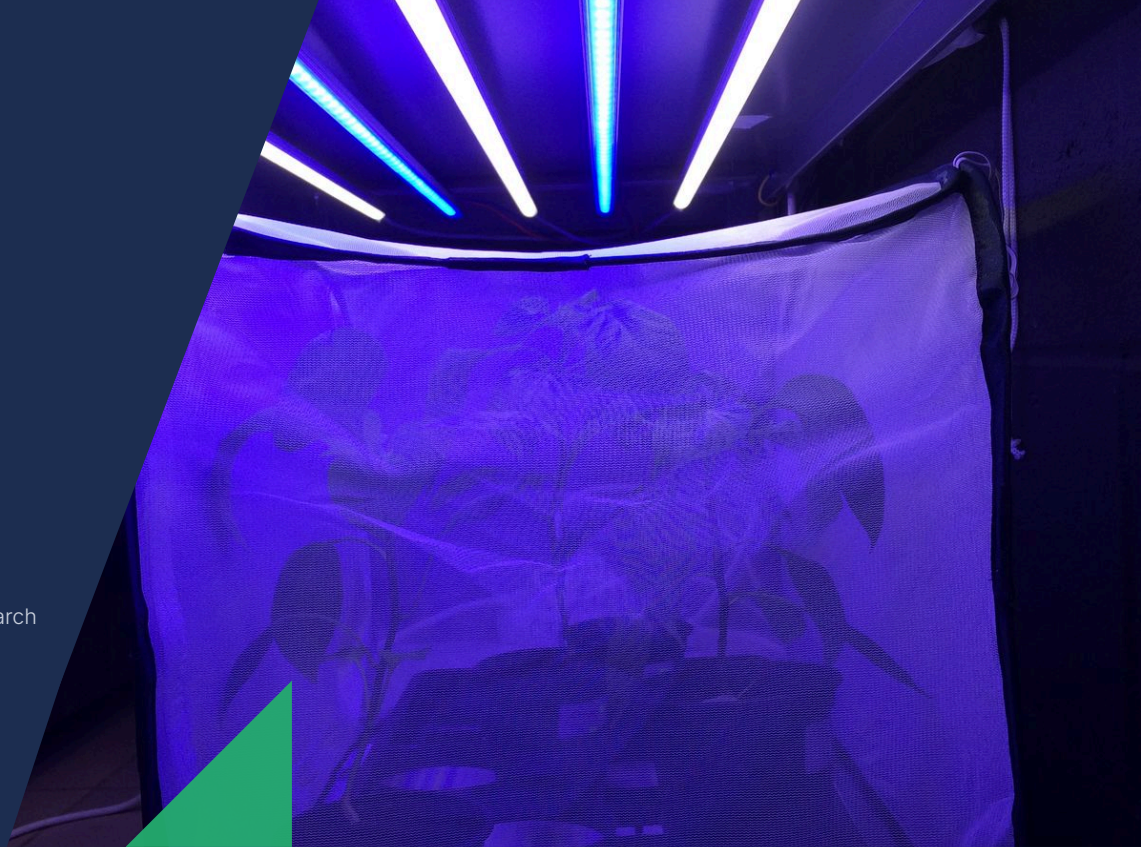
Colasse



CASE STUDY

Horticulture · Vegeled

Integrated pest management research

LEDs, an eco-friendly solution to crop pests

With Haute École Provinciale Condorcet (Ath, Belgium), Colasse explores how targeted wavelengths can help protect greenhouse crops.

3	2	400–700
types of insect photoreceptors: UV, blue and green	crops studied: strawberry and pepper	nm: the light spectrum visible to the human eye

An encouraging solution for crops

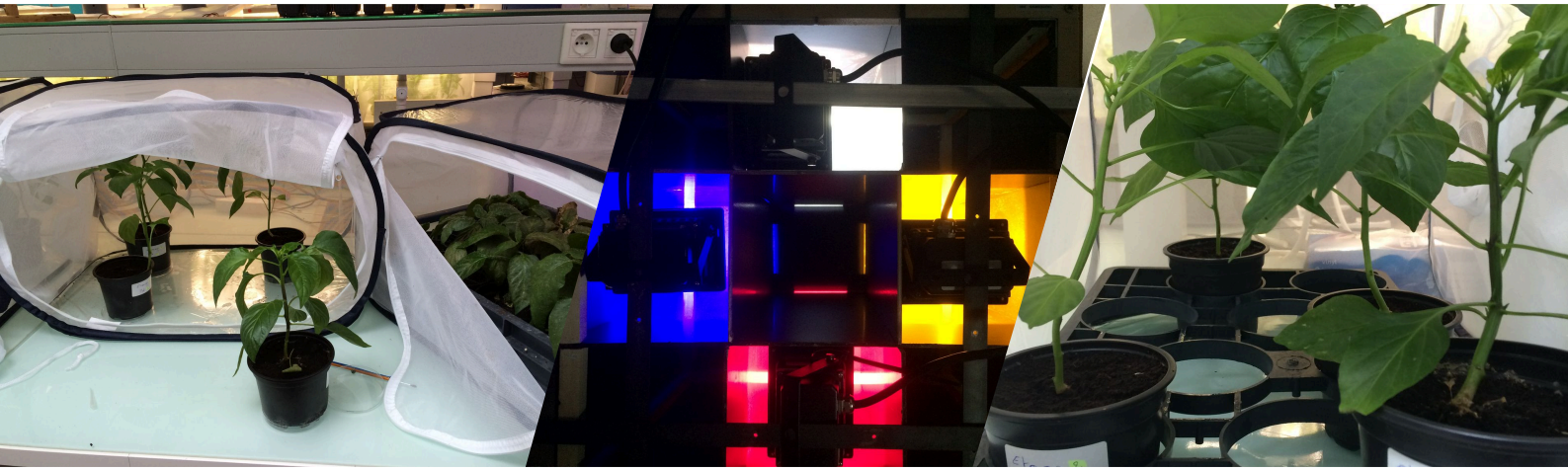
In the horticultural sector, more and more professionals are looking for eco-friendly alternatives to chemical treatments that are less harmful to health and the environment. With its low energy use, narrow spectrum and ease of use, **LED lighting is a very promising way to limit pest infestations in greenhouses**, based on how insects respond to light.

LEDs already offer intense light, low energy consumption and a longer lifespan than traditional lamps. Industry, research centres and growers now use them regularly to optimise their experiments and their crops.

How does it work?

The light spectrum is the set of light waves that make up a palette of colours. The human eye perceives visible light from violet (400 nm) to red (700 nm), with its highest sensitivity in the green. Most insects see differently: their eyes use **three types of photoreceptors**, with sensitivity peaks in the UV, blue and green.

LED lighting can therefore target precise parts of the spectrum to trigger a specific response. A wavelength that repels insects or limits their movement can keep them away from crops; one that attracts them can act as a **light trap** (positive phototaxis).



Promising experiments in greenhouse cultivation

Experiments were carried out by the **Haute École Provinciale Condorcet** (Ath, Belgium), with Colasse supplying the lighting systems (**Vegeled LED strips**), as part of the **Novallia** call for innovative projects.

Strawberries and thrips

Strawberry production is often affected by thrips, which growers fight with predatory bugs such as *Orius laevigatus*. In the laboratory, both the bugs and the thrips were attracted by certain wavelengths. A dedicated lighting system showed strong potential to manage this pest, in particular by attracting the bugs to trap plants.

Peppers and aphids

For the aphid *Myzus persicae*, a major pest of peppers, a **low-UV environment reduced its movement**, as it struggles to locate itself in space. Blue and green, which dominate sunlight reflected by leaves, seem to attract it.

Tests on the parasitoid wasp *Aphidius colemani* showed that certain wavelengths directly influence its behaviour, allowing better control of aphid populations. These findings open new avenues for aphid management in covered crops and for breeding parasitoids in the laboratory.

Keeping a holistic view

Plants and beneficial organisms must not be weakened by the targeted use of these wavelengths. Repeated studies under real-world conditions are needed to calibrate this new use of LEDs in greenhouses.

Optimising greenhouse productivity while ensuring crop quality is a delicate balance that artificial LED lighting can help achieve. **Colasse is looking for partners to develop eco-friendly pest control solutions in real-world conditions** with its Vegeled technology.

Want to know more?

Haute École Provinciale Condorcet du Hainaut (Ath, Belgium) – Dr Matthias Gosselin – **matthias.gosselin@condorcet.be**

Colasse

Understanding your challenges is already securing your project.
Let's talk.

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