

# **(Artificial) light in soft fruit!**

11-1-2018 Lisanne Helmus-Schuddebeurs



Worldwide Expertise for Food & Flowers

# To introduce myself

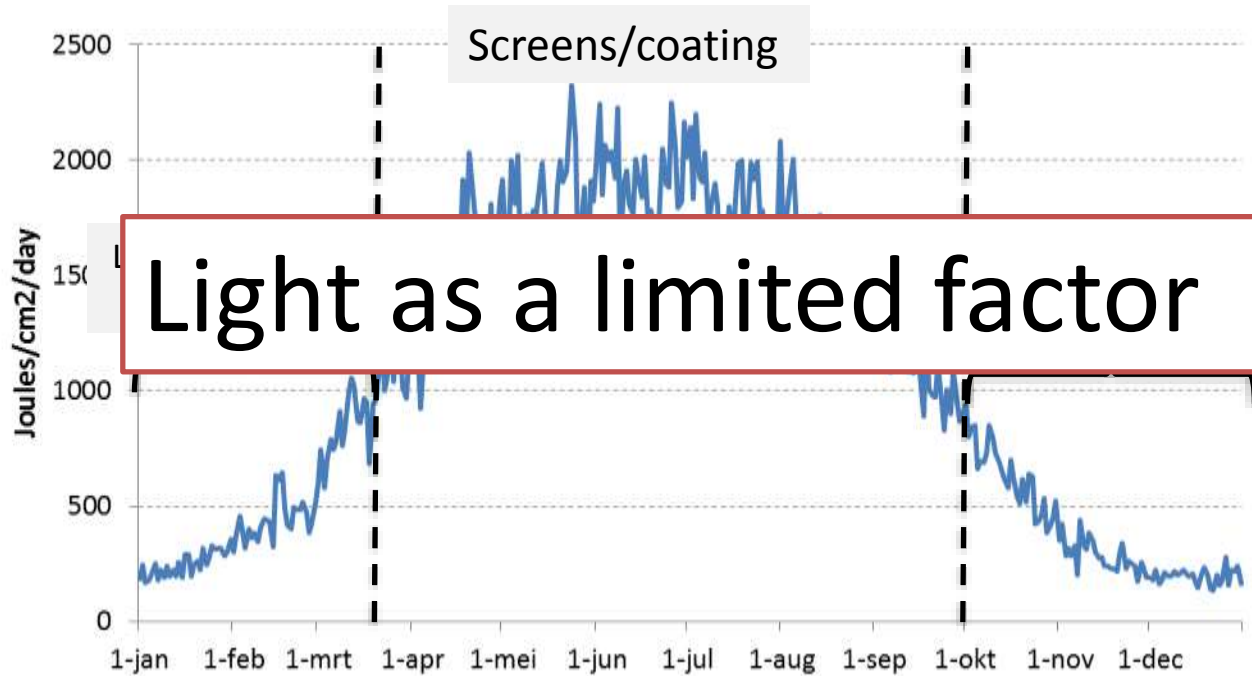
- ✦ Lisanne Helmus-Schuddebeurs
- ✦ Grown up on a tree nursery
- ✦ Studies MSc Plant Sciences  
(Wageningen University)
- ✦ Researcher Greenhouse Horticulture
  - Focus: Climate and (artificial light)



# Light and plant growth.

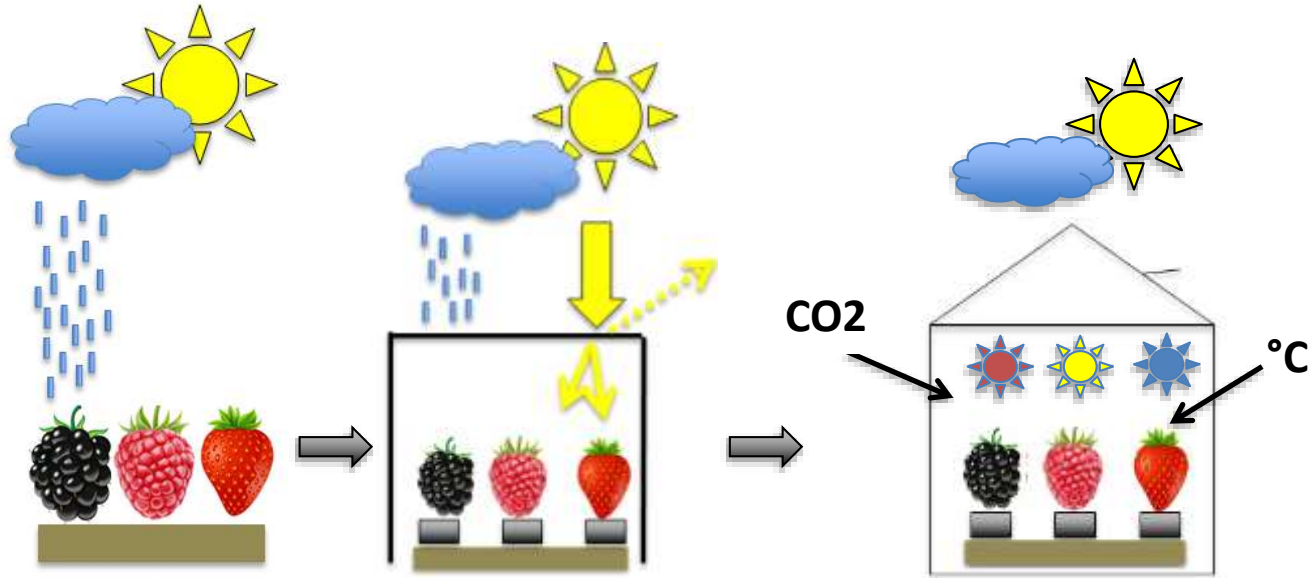
- ✦  $6 \text{ CO}_2 + 6 \text{ H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$  (Photosynthesis)
- ✦ This reaction requires light.
- ✦ Period with optimal conditions is limit.
  
- ✦ In the winter  $\rightarrow$  too less light!
- ✦ In the summer  $\rightarrow$  too much light!

# Yearround availability



Bleiswijk, Netherlands

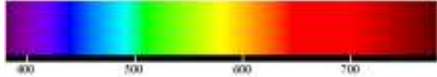
# Developments in growing system



# Artificial light gives us new possibilities

- ✦ 1% more light = 0.5 – 1% more production.
- ✦ Produce in periods when light is limited.
- ✦ Better price setting.
- ✦ Continuous production.
- ✦ Higher yield per m<sup>2</sup>.

# Reaction of the plant on artificial light

- ✦ Light has two functions for the crop:
  - Growth (Photosynthesis)
    - PAR region →  (400 – 700 nm)
  - Controlling plant processes
    - Specific lighting colors have an specific effect on the plant. (Red : Farred).
    - Can also influence production.

# Sources of artificial light: LED and HPS



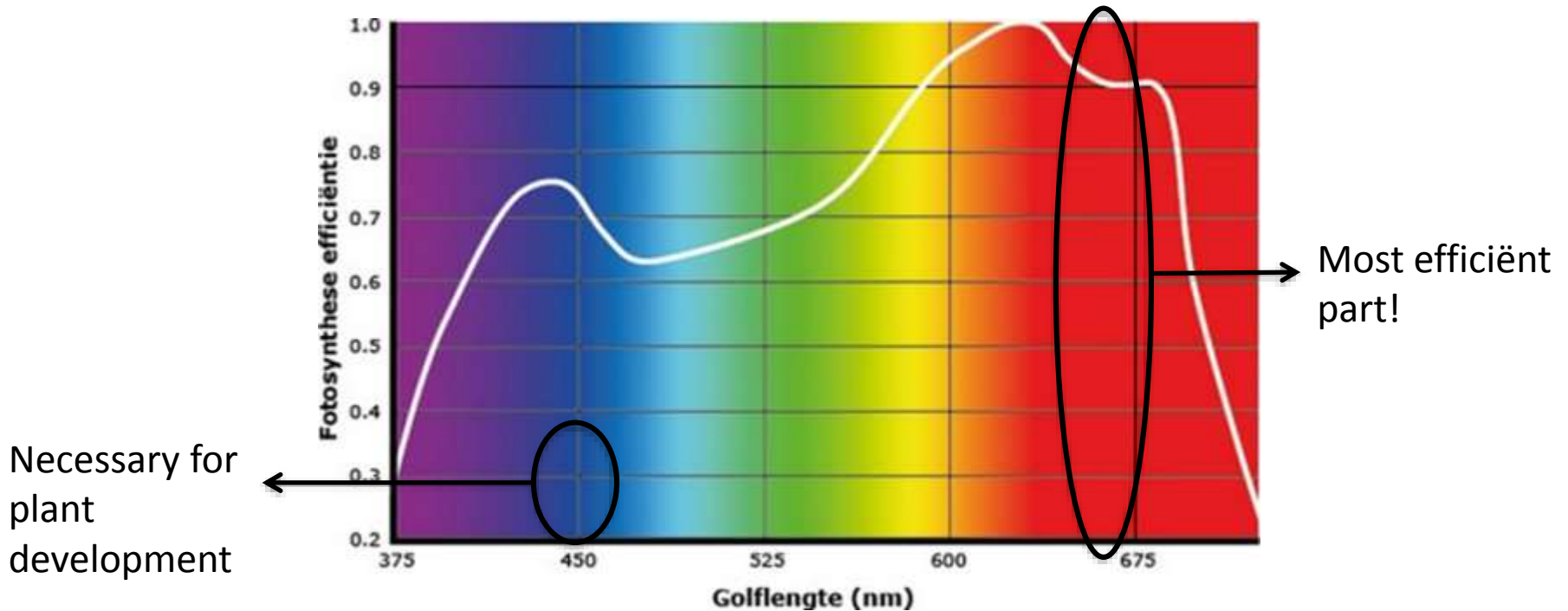
VS



- ✦ More  $\mu\text{mol}'\text{s}/\text{Watt}$  energy input.
- ✦ Less heat production.
- ✦ Specific wavelength (light spectrum).
- ✦ Climate and light be more independent.
- ✦ Lower plant temperature.

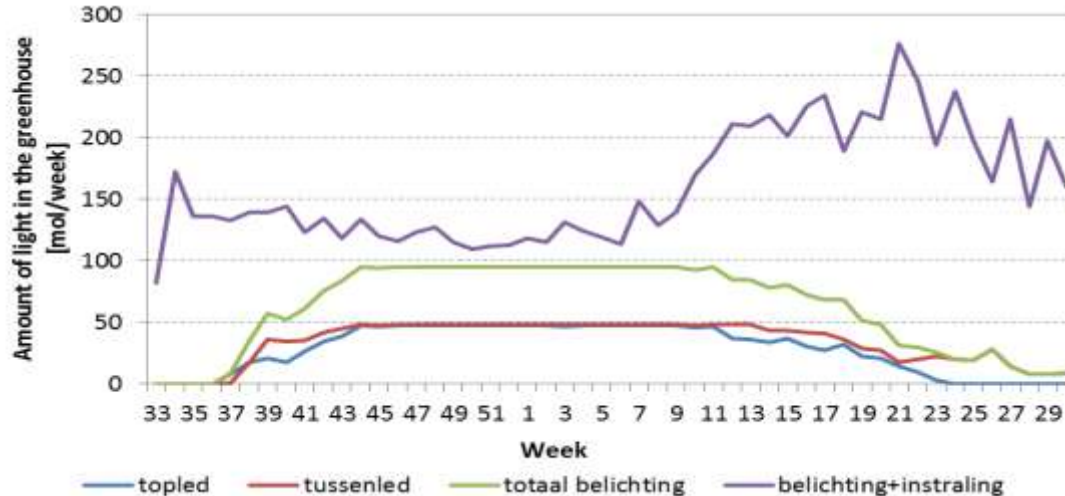


# Photosynthese efficiëntie



# Artificial light is additional to sunlight

- ✦ Artificial + Daylight = total lightspectrum.
- ✦ Higher intensity and hours influence the ratio.



# Trial with Raspberry and Blackberries

- ✦ Market for soft fruit is increasing.
- ✦ Product from the Netherlands only available between april and november
- ✦ Short Shelflive → Short chain.
  
- ✦ Availability outside standard production schedule gives new market possibilities.
- ✦ LED light gives new possibilities for sof fruit production out of season.

# Proof of Principle

- ✦ Combine knowledge from regular cultivation and knowledge from crops with artificial light.
- ✦ Focus on the possibilities.
- ✦ Gain as much knowledge as possible.
- ✦ Blackberry is in the lead.
- ✦ Raspberry is added for knowledge development.

# Knowledge from other crop.



# Objective

## **Long term objective:**

Producing blackberries and raspberries during the winter (December till May) by using LED light.

## **Trial objective:**

Realise an earlier production which starts in March and ends in May.

# Trial set up

- ✦ Department 150 m<sup>2</sup>
- ✦ 120  $\mu\text{mol}/\text{m}^2/\text{s}$  LED light above the crop
- ✦ 88  $\mu\text{mol}/\text{m}^2/\text{s}$  as interlight
- ✦ 2 gutters for blackberry and raspberry
- ✦ Planting date 20 November



# Trial set up

- ✦ **Blackberry:** Loch Ness and Asternia
  - Packed Half Octobre → 500 hours of cold!
- ✦ **Raspberry:** Kwanza ; Aurora and Enrosadira
  - Packed end of Septembre → 6 weeks cold storage



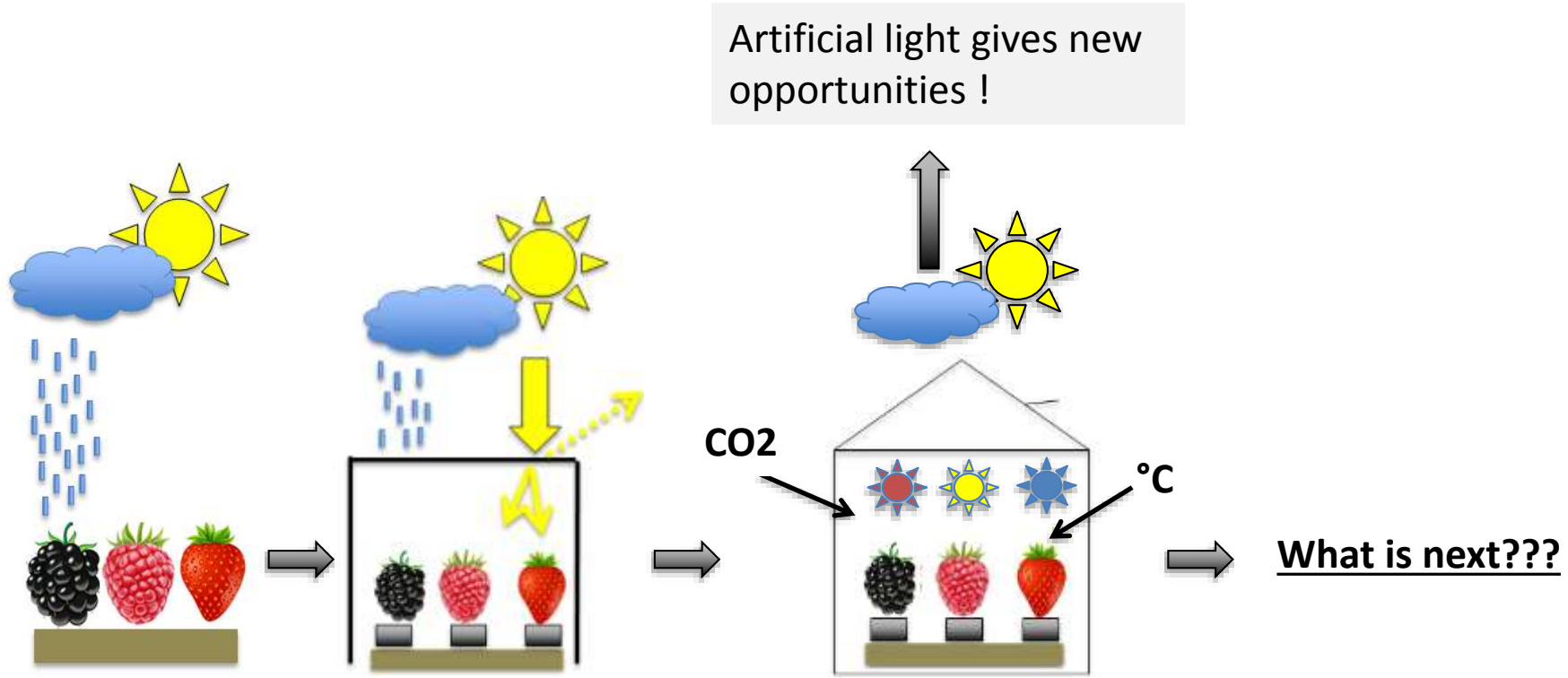
# Current situation: Blackberry



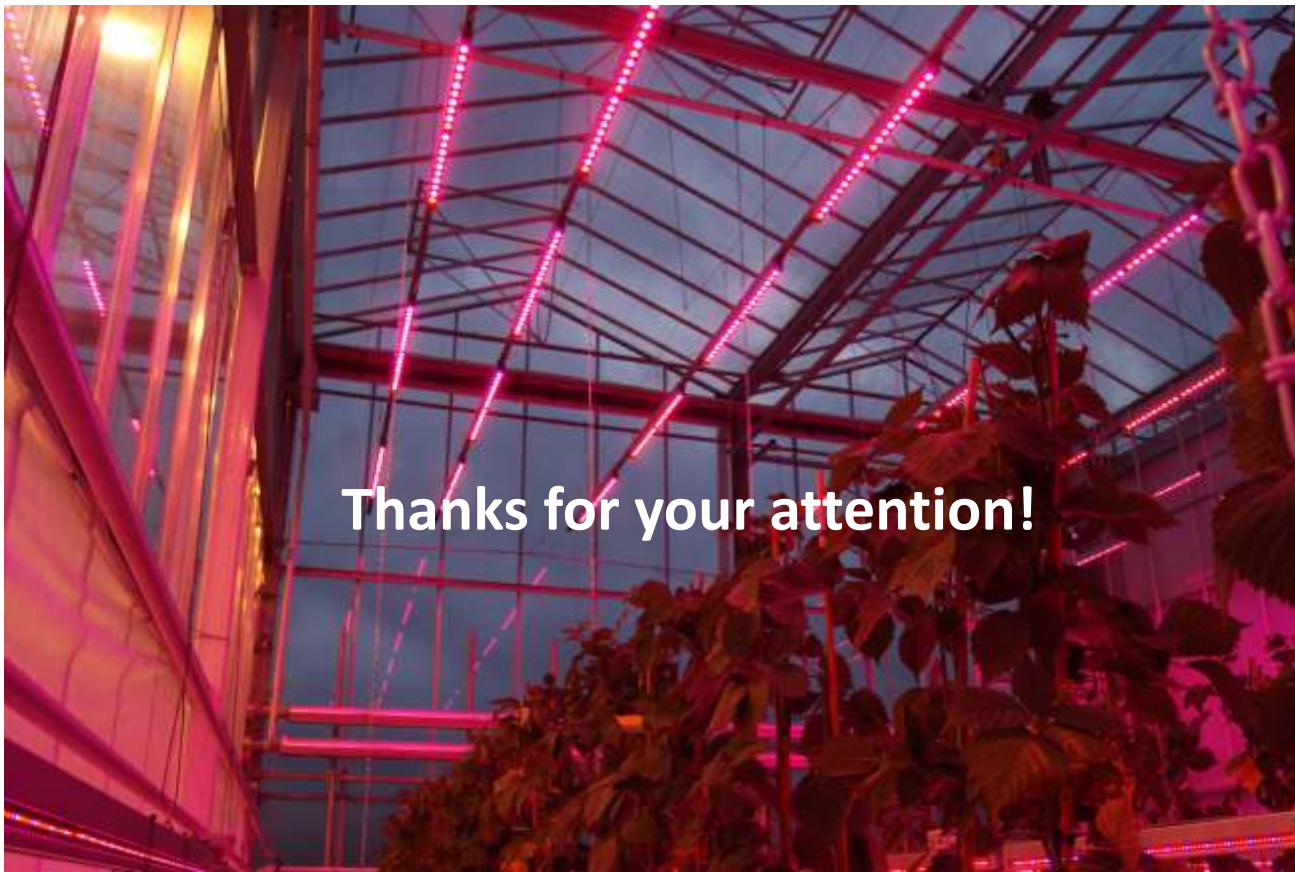
# Current situation: Raspberry



# To wrap up!







Thanks for your attention!