Saint-Gobain Cultilene

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Agenda

1. Introduction Cultilene
2. Habitat “Greenhouse” - Water efficiency
3. Habitat “Greenhouse” - Energy efficiency

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Saint-Gobain Cultilene = Horticulture

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Communication

A new range of substrate products for vegetable cultivation

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Production locations 2012

Gliwice:
1 slab line*

Tilburg:
1 slab line
3 cube lines
2 plug lines
n diverse

Castolovice:
1 slab line
1 cube line

Zeas:
1 slab line*
(second brand)

Envirotex:
1 cube line
1 slab line*

Transformados:
1 slab line
1 cube line

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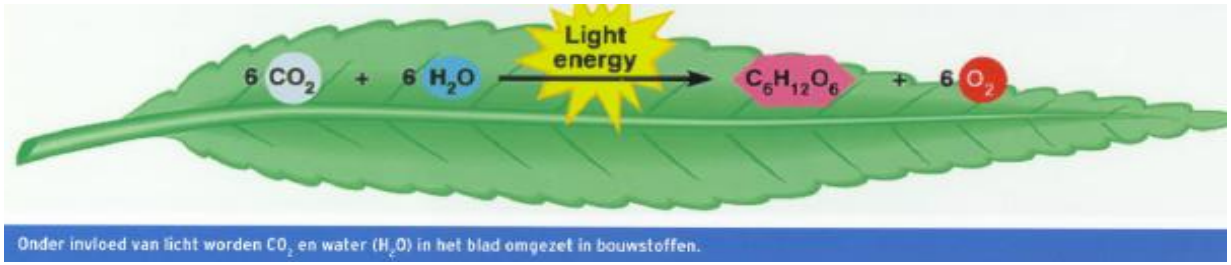
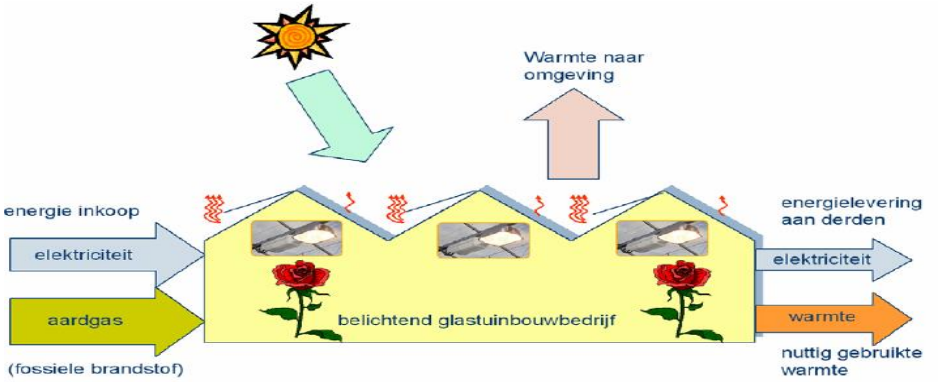
Horticulture- 3 main challenges

- Maximum production output with minimum input per M2



- Energy neutral production of greenhouse crops by 2020

- Zero emission of water and nutrients by 2027



MISSION

➤ to offer innovative solutions to optimize water management and energy consumption to enable growers to improve quality and make savings in fertilizer, water and energy consumption and to contribute to a sustainable horticulture

➤ **to play a bigger role in the daily business of our customers……**

STRATEGY Cultilene horticulture growth model

- Organic growth with good quality stone wool product supported with advice about water and irrigation management
- Enter network among key players within horticulture
- Improve competitiveness, profitability and sustainability by local production and transformation
  - Source local stone wool within SG or by partnerships
  - Introduction of local recycling solution in each region
  - Innovation:
    - **By introducing glass wool and organic option**
    - **Give meaning to water management: pH and O2 measurements**
    - **Develop new irrigation/substrate concept: project "Campina"**
- Optimize supply chain supported by automated reliable machines
- Habitat "Greenhouse":
    - **Urban farming, Diffuse glass, (Insect) Screens, Filtration**
- New business: Cultiwall

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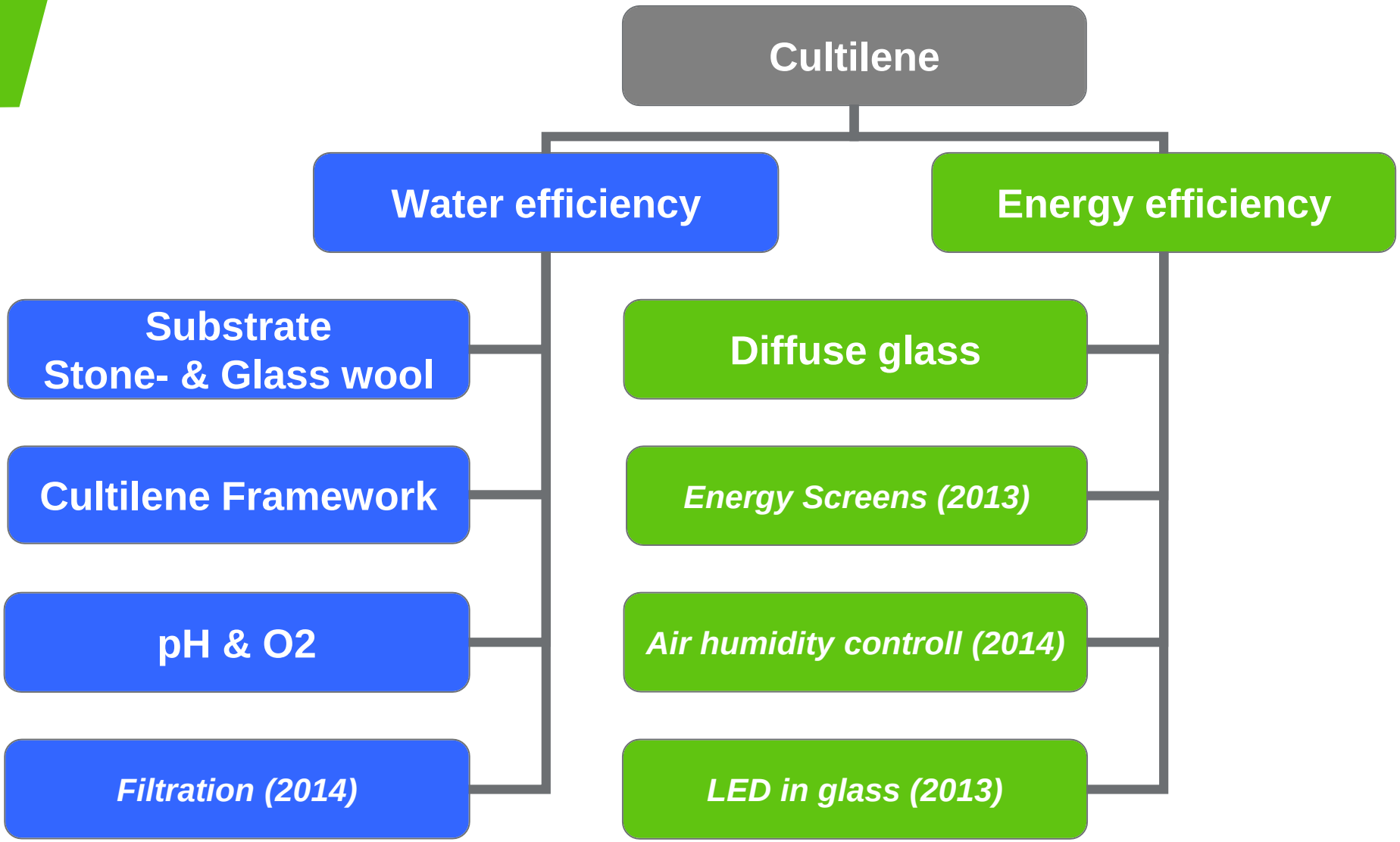
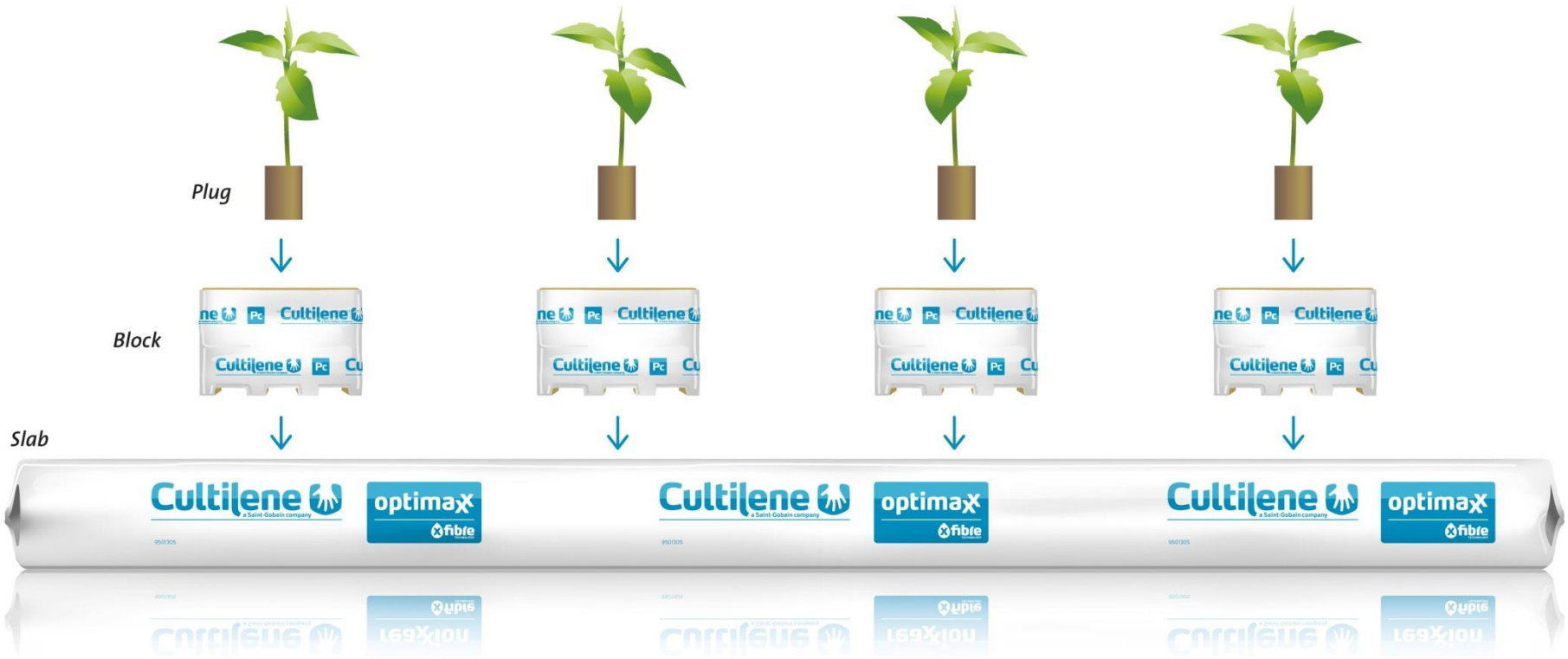
Habitat Greenhouse



Habitat Greenhouse – Water efficiency

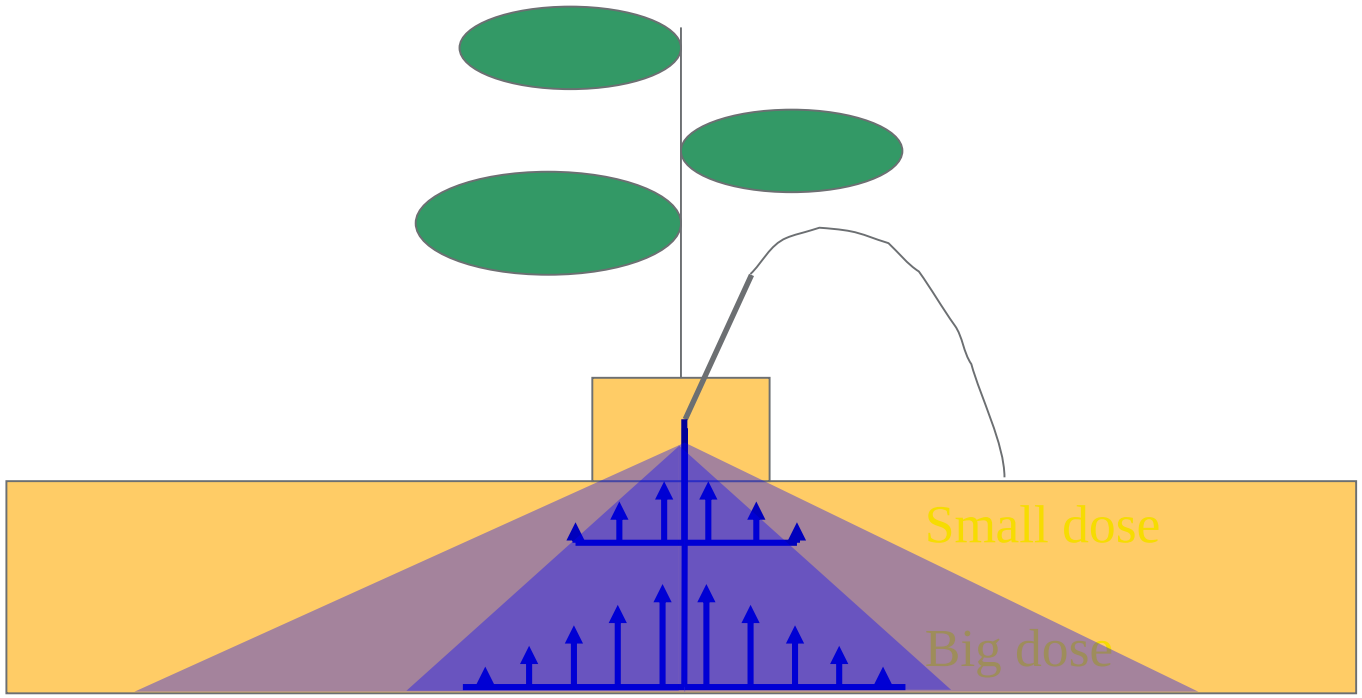
Substrate

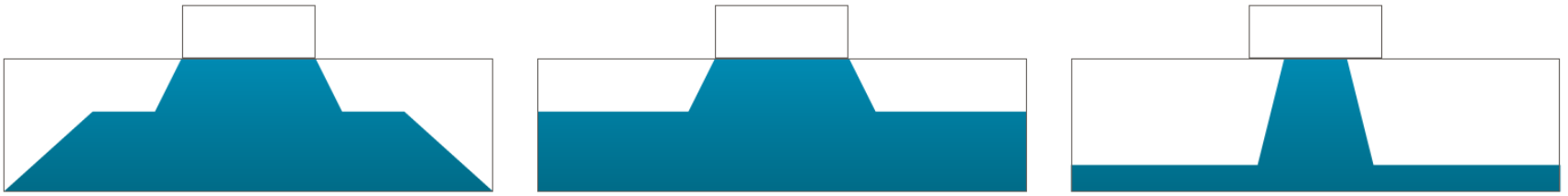


Cultilene Framework: Dose size

Cultilene Framework

Dose size has big effect on water content, the cone and homogeneity of the slab



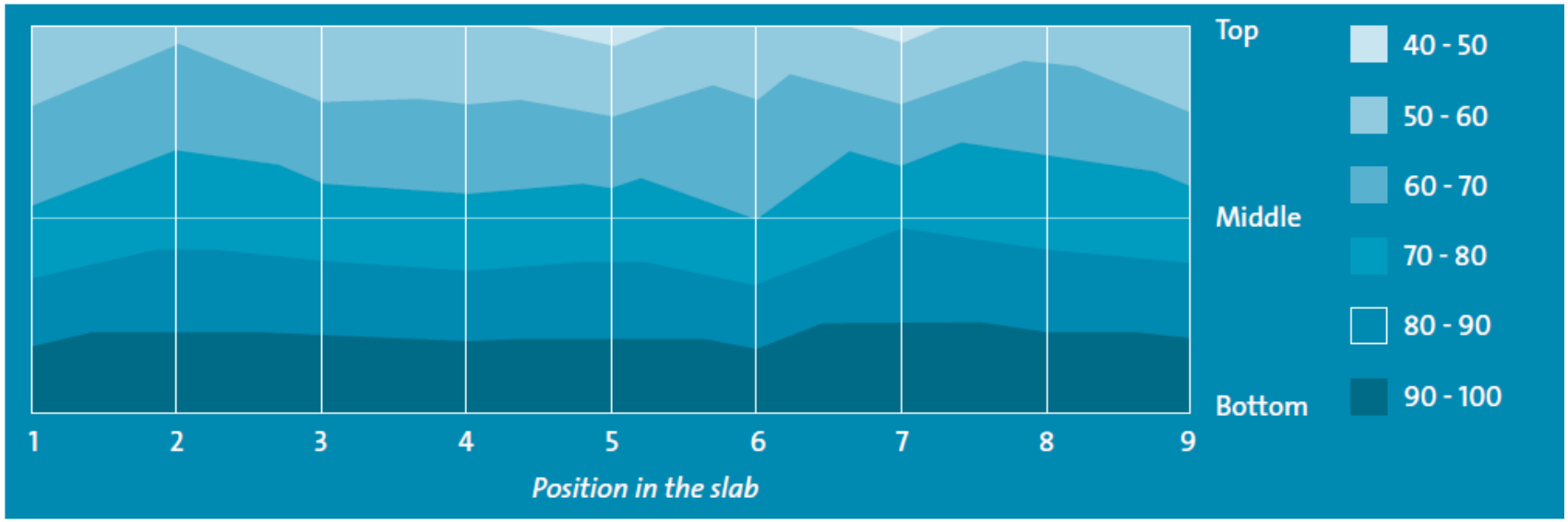


Too small dose *Optimal dose* *Too large dose*

Cultilene Framework: Horizontal measurements

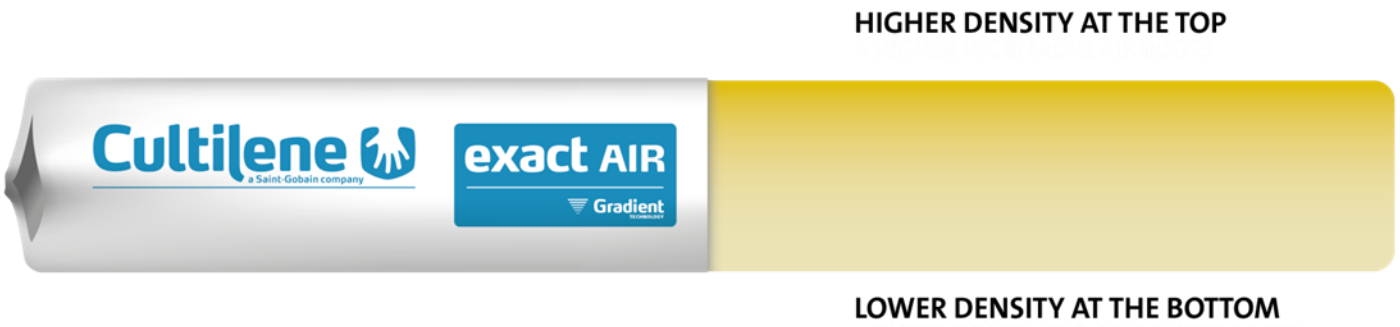
Cultilene Framework

- Fixed sensor measurement
- Hand meter measurement ->With Cultilene's horizontal measuring method it is possible to make water distribution maps that represents how water and Ec is distributed in the slab



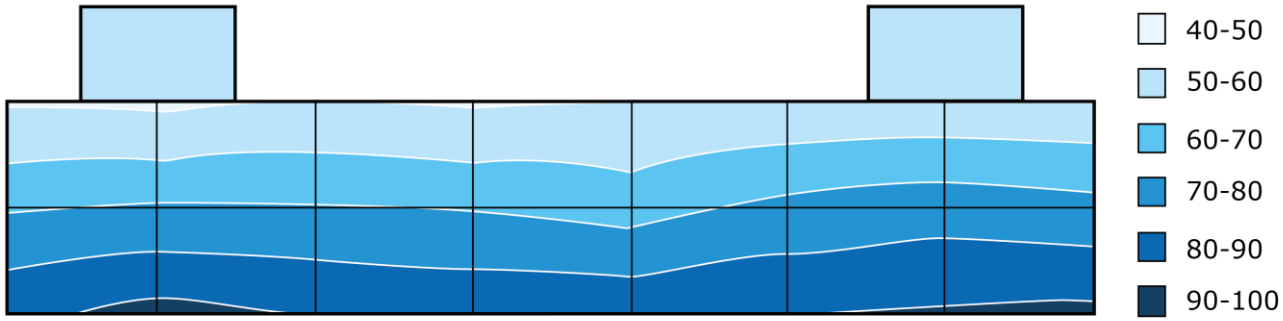
Cultilene Framework - Exact AIR

- *The density of the stonewool will influence the amount of water which is held by the slab. The higher the density, the higher the water content.*

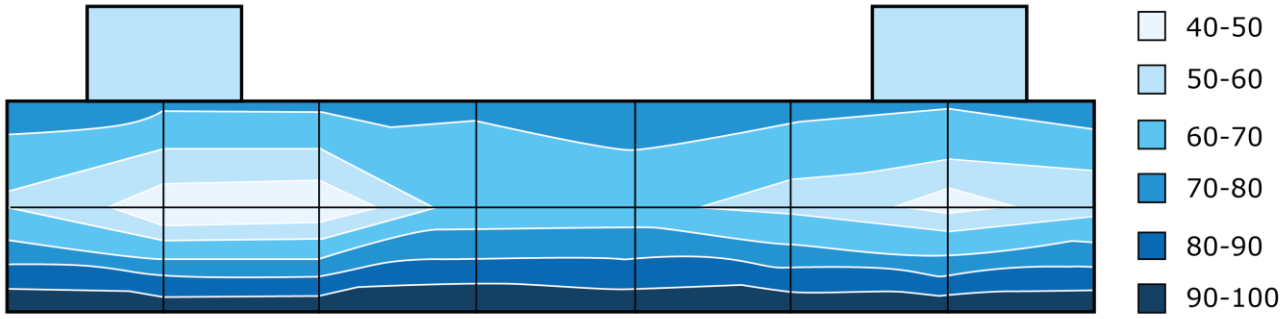


- *With exact AIR the density of the stonewool decreases gradually from the top to the bottom of the slab. This is to increase the water content higher up in the slab and decrease it lower in the slab. With the new gradient technology this is done evenly over the height of the slab and avoids areas within the slab that are drier or higher EC.*

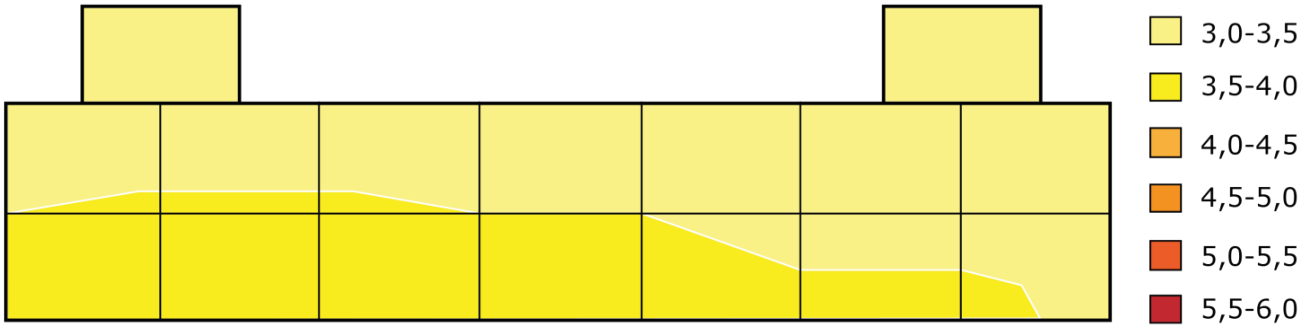
Water Content (in %) in Exact Air after drain



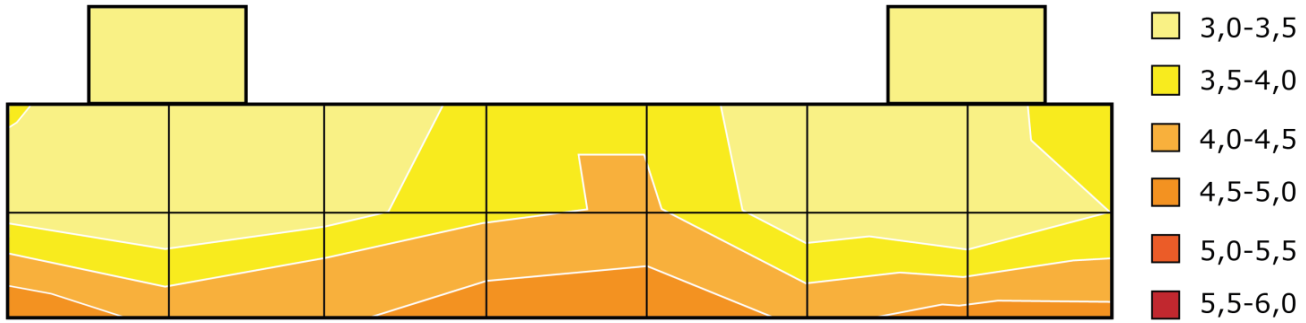
Water Content (in %) in standard slab after drain



EC-distribution (in %) in Exact Air after drain



EC-distribution (in %) in standard slab after drain

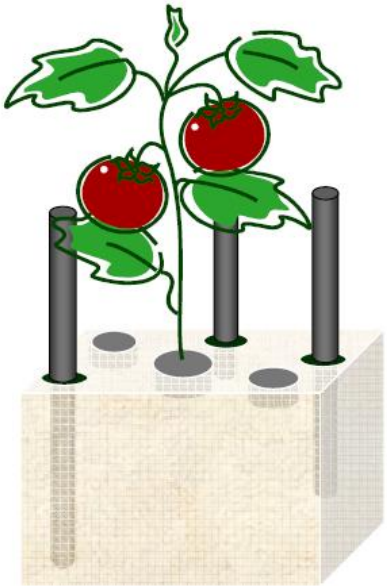


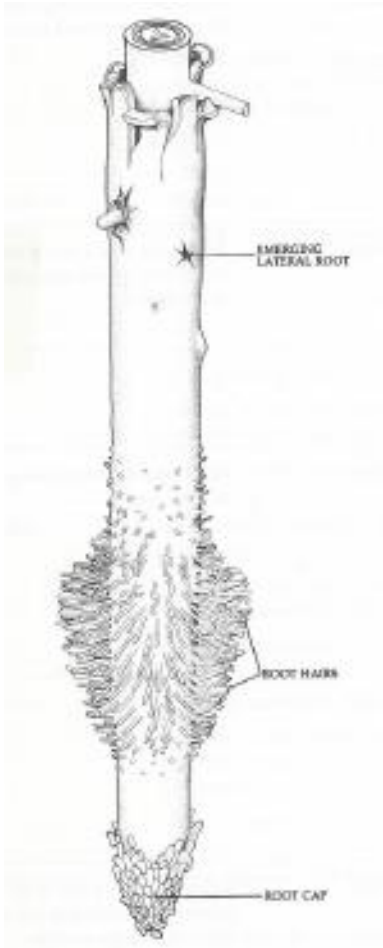
Exact AIR - Poland

pH controll – uptake of nutrients influenced by pH

- provide service to growers to better understand and control root environment and control of the plant growth

- **Principle:**
  - **Fluorescence**
  - **Glass fibre with pH sensitive coating**

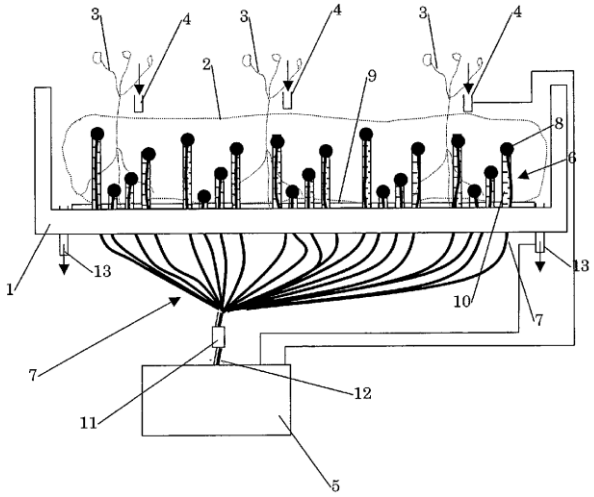




O2 monitoring

- provide service to growers to better understand and controle root environment and control of the plant growth
- Principle:
  - Fluorescence glass fibre with O2 sensitive coating
  - Base plate with multiple layers/levels
  - Overall view instead of small spot
- Partners:
  - Fytagoras
  - Grow technology
  - Cultilene

Figure 1

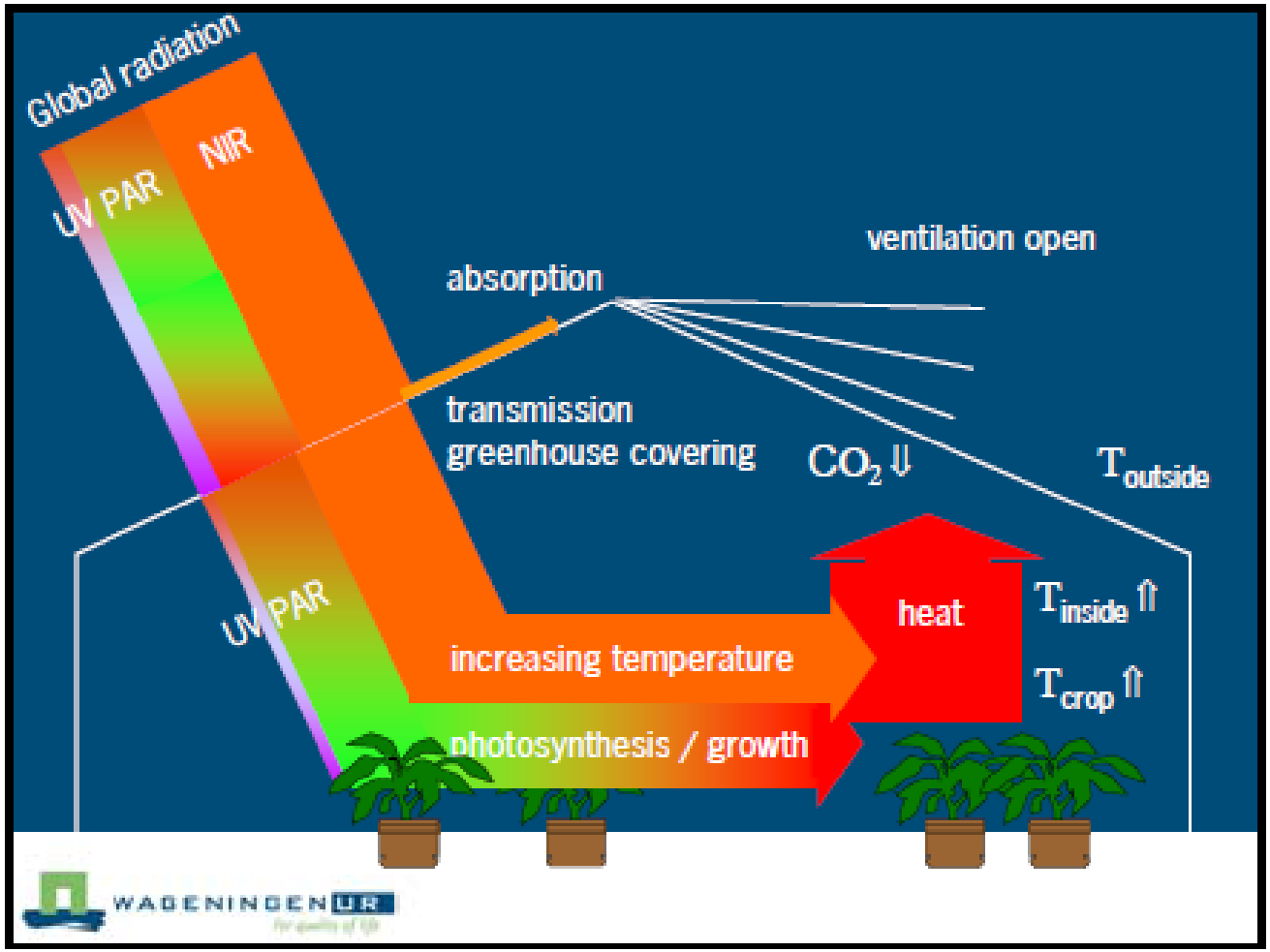


Introduction of Glass wool 2012

- Proposition: ***Most sustainable and controllable substrate….***
- General
  - High pH stability (fibre more stable for lower pH in substrate)
- High control to create generative and vegetative actions
  - Easy draining → longer EC- control period (period 2 in daily dynamics)
  - High reactivity
- Sustainability
  - Low carbon footprint
  - 80% recycled glass
  - Recycling with SMB creating closed loop
  - Water use in production process
  - Worldwide availability

Habitat Greenhouse - Engery

Diffuse glass



Vertical gardens / Green walls by Cultilene:

CultiWall

www.cultiwall.nl

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Energy-saving, innovation, environment-protecting.

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INNOVATIVE MATERIALS

Thank you for your attention!!

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