How does WUR support/enhance innovation in the horticulture sector? How does WUR cooperate with growers?

Dr. Silke Hemming, R&D manager Greenhouse Technology, Wageningen UR

WAGENINGEN UR

Long history of innovation

- Wageningen University founded in 1918 (based on 1876 Rijkslandbouwschool) currently 9426 students and 106 nationalities on Wageningen Campus
- Horticulture applied research started already 1899 in Naaldwijk and in Aalsmeer currently 1.2 ha very modern research facilities in Bleiswijk

Greenhouse Horticulture - Multidisciplinary

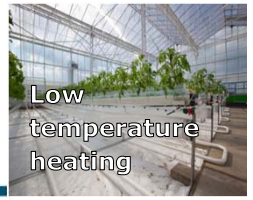
- Fundamental research → Applied research
- Chain: Breeding → technology → grower → consumer
- Expertise: Genetics, physiology, plant nutrition, entomology.. artificial intelligence, robotics, electronics, economics

Innovation & Demo Centre

Innovation and Demonstration Centre (IDC) Energy

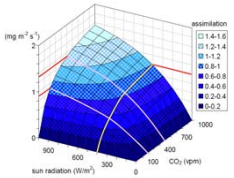
- **What:** innovations for energy saving in greenhouse production by new technologies and new cropping strategies
- **Who:** Wageningen UR, greenhouse supply industry, growers
- New ideas – facts&figures – many visitors

IDC Energy - research issues 2015



The basics of modern energy saving crop production

Analysis of humidity effects on growth and production of glasshouse fruit vegetables

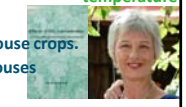


Development and dry matter distribution in glasshouse : a quantitative approach temperature

Udink ten Cate ('70), Bot ('80), de Zwart ('90), Vanthoor (2012): Modeling and control of greenhouse physics, dynamic modeling, incl. crop and economics

Different phds, the scientific basics

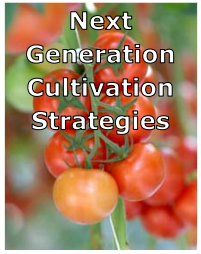
Stanghellini C. Transpiration of greenhouse crops.
Campen J. Dehumidification of greenhouses



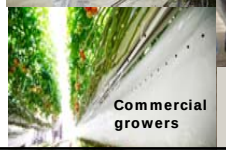
And many more....

Effects of CO2 concentration on photosynthesis, transpiration and production of greenhouse fruit vegetable crops

"Het Nieuwe Telen" integrated approach of energy saving crop production

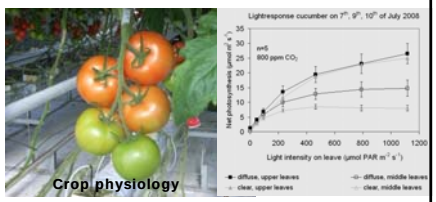


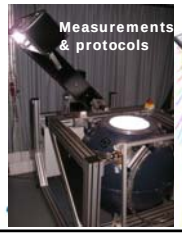
- Test integrated approach in research
- Monitor at growers
- Result: 10-30% energy saving

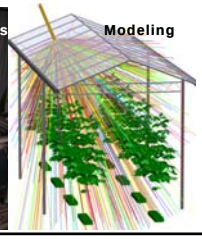


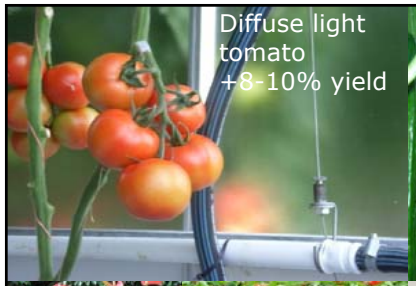
Already 146 ha commercial greenhouses with HNT

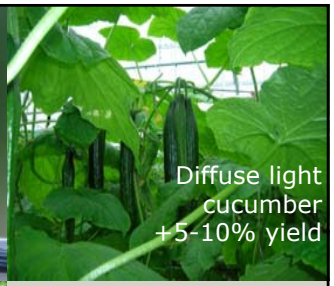
Diffuse light

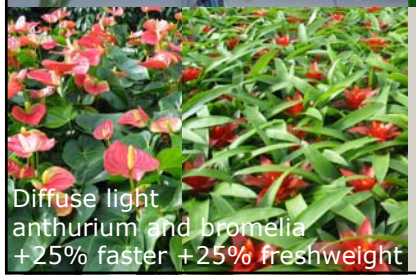










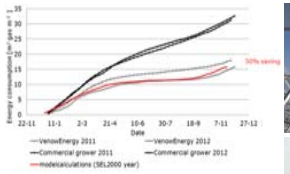


Already 125 ha commercial greenhouses with diffuse glass

VenLowEnergykas

Goal: Greenhouse concept with high**est** energy saving and **good** tomato production

- Double glass with low u-value and high light transmission
- Mechanical dehumidification with heat-regain
- "Next Generation Cultivation Strategies" (climate control)
- Result: ca. 50% energy saving

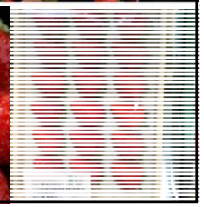


VenLowEnergykas

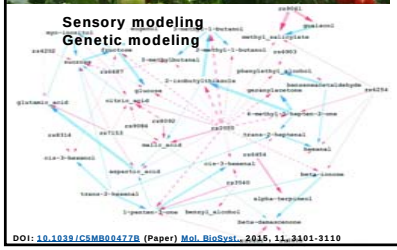
- Upscaling to practice
- Ca. 1.ha commercial greenhouse ID Kas®
- Duijvestijn tomato grower

IDC Taste

- **What:** quantify and improve taste of fresh products
- **Who:** Wageningen UR, international breeding companies, consumers



IDC Taste



Expertisecentre Agro-robotics @WUR

Intrarow weeding (B2B)

Steketee

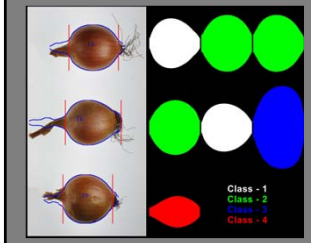
Sweet pepper harvest (EU, companies)

CROPS "Clever Robots for Crops"

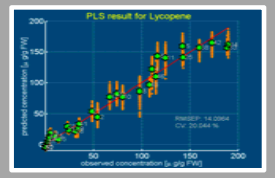
Sweeper

Expertisecentre Agro-robotics @WUR

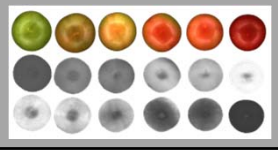
Phenotyping and breeding (e.g. ImageJ plugin for variety testing)



Postharvest quality and sorting (e.g. hyperspectral)

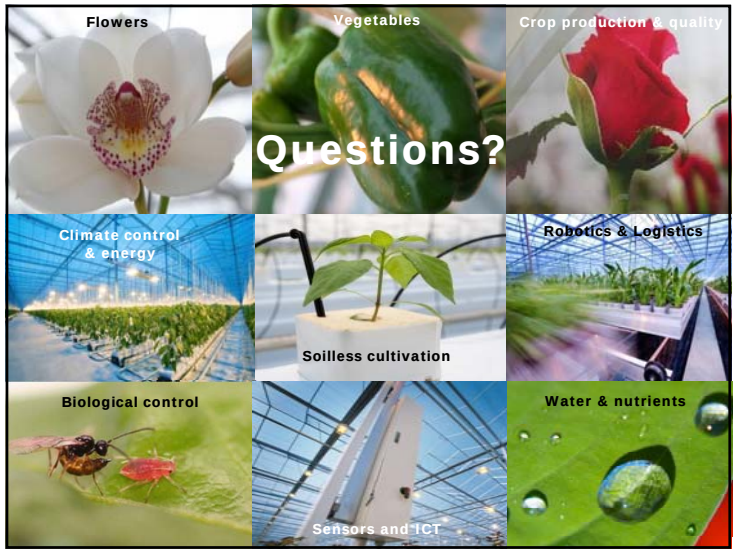


"WUR intelligence inside" commercial machines




International Activities
Multinational companies,
High-tech companies,
Food companies,
international gov
E.g. Japan:
Mitsubishi Chemicals,
Asahi Glass, Kaneka,
Kuraray, Kajima,
Nippon Del Monte Agri,
Kikkoman,....
WAGENINGEN UR


State Visit @WUR
WAGENINGEN UR
Seminars @WUR
Royal Visit Japan
Visitors @WUR
International
training courses
WAGENINGEN UR


Flowers
Vegetables
Crop production & quality
Questions?
Climate control
& energy
Soilless cultivation
Robotics & Logistics
Biological control
Sensors and ICT
Water & nutrients