Wageningen UR Greenhouse Horticulture
Research and innovation: networking with knowledge

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Location: Bleiswijk
- 85 greenhouse compartments
  - normal ventilation, cooling, complete airco
  - artificial light
  - soil, substrates, tables
  - Insect breeding
- Crop protection laboratories
- Test facility taste of products

Location Wageningen
- Specific laboratories (e.g. robotics, light measurements)
- 2 Experimental greenhouses

Research topics
- Energy and climate
- Water and emissions
- Advanced production systems
- Sustainable crop protection
- Quality of crop and product

Research 2010/11
- Sustainable and energy saving greenhouses
  - Innovation and Demonstration Centrum:
    - Sunergy greenhouse
    - VenlowEnergy greenhouse
    - Climate neutral greenhouse with controllable daylight system
    - PV on ZonWindKas
  - Electricity delivering greenhouses (Elkas II, Fresnel greenhouse)
  - EU Project EUPHOROS: Minimum use of resources for sustainable greenhouse systems in Europe
  - New (sustainable) greenhouse regions

Research 2010/11
- Water and emissions
  - EU Project FlowAid: control and prediction of irrigation/fertigation (booklet published)
  - Chips & sensors (WET-sensor, WGM-meter, E-sense)
  - Recirculation roses without emissions
  - Emissions from chrysanthemum on substrates
  - Emission management of soil grown crops
  - Tool emission effects crop protection chemicals to water (CTGB)
  - Emission from protected cultivation systems to air (EFSA)
Research 2010/11

Advanced crop- and production systems
- PhD student: Bert “Design methodology for sustainable automated growing systems”
- PhD student: Wouter “Development of a sweet peerer harvesting robot”
- EU project Clever Robots for Crops
- Automated weed control for open field application (Steketee)
- Mushroom production of the future
- Work is gaming: working in horticulture in 2026

Sensortechnology for quality of crops and products
- Detection plant stress, pests and diseases (MIPS robot, MIPS camera, x-y table, Plant Facility)
- Detection of longhorn beetle in wood by x-ray
- Detection of fusarium oxysporum in tulip, phytophthora in potato, xantomonas in strawberry
- Detection of leaf necrosis hortensia
- GFP in cabbage
- Detection of seed germination and quality

International
- PhD student: Bram “A systematic integral greenhouse design”
- Sustainable innovation centre in Turkey (2g@there, BOCI)
- Sustainable horticultural research centre in UAE (Env. Agency Abu Dhabi)
- Greenhouse design for tropical lowland in Malaysia (BOCI)
- Co-operation subtropical greenhouses in Taiwan (BOCI)
- Improvement horticultural produce in Algeria (2g@there)
- Triple P in Egyptian Horticulture (BOCI)
- GreenFarming East Africa (Kenya & Ethiopia) (EVD)
- IPM in Ethiopia (BOCI)
- Vegetable production & consumption in Kenya (BOCI)
- Market assessment Mexico (BOCI)
- Energy saving in greenhouses in Norway (Veksthus)

Sustainable innovation centre in Turkey
- Role WUR: Design study sustainable greenhouse centre in Turkey (BOCI)
- Centre built in 2011 at Turkish geothermal energy company by consortium Dutch companies
- SeraCulture (2g@there) to increase horticultural cooperation Turkey - The Netherlands

Sustainable horticultural research centre (VAE)
- Goal: Making protected horticulture in Abu Dhabi
  - Sustainable on water resources
  - Increase of food safety and food security
  - Capacity building
  - Demonstration of technology

Malaysia: a greenhouse for lowland tropics
- Introduce a greenhouse suitable for lowland tropical climate conditions
- Stakeholders
  - Department of Agriculture
  - Growers
  - Asian Perlite Industries
  - Wageningen UR
  - Greenhouse Horticulture
  - Centre for Development and Innovation
Co-operation subtropical greenhouses in Taiwan

- Goal: promote a sustainable Taiwanese greenhouse horticulture following a public-private approach involving business, research and government from the Netherlands and Taiwan
  - platform for networking for research, industry and government
  - developing a vision on sustainable horticulture in Taiwan, in particular for the orchid sector
  - designing roadmap for a public-private based innovation and demonstration centre in Taiwan

Improvement horticulture produce in Algeria

- Improvement of the existing horticulture sector and horticulture products in order to meet the rapidly growing income, population and demands of Algeria of horticultural products
- Project partners:
  - Vrian projects
  - Naktuinbouw
  - Wageningen UR Greenhouse Horticulture
  - PTC+
  - The Netherlands Ministry of Economic Affairs, Agriculture and Innovation and the Ministère de l’Agriculture et du Développement Rural de l’Algérie

Triple P in Egyptian Horticulture

- Increase the sustainability of the horticultural production in Egypt
- Entry points
  - water, nutrients, crop protection, post-harvest, quality
  - People, planet, profit
  - Realize incentives to change behaviour and obtain certain effects
  - Integrate over the value chain

GreenFarming East Africa (Kenya & Ethiopia)

- Provide solutions for profitable and sustainable business results
- 2g@there financed
- Stakeholders
  - 20 Dutch companies
  - Growers in Africa
  - AVAG, DLV
  - WUR
  - Min. of EA&I
- Themes:
  - Water management
  - Crop Management
  - Climate and Energy
  - Post Harvest & Logistics
  - Research and knowledge transfer
  - 2010 - 2013

IPM in Ethiopia

- Ethiopia Netherlands Horticulture Partnership Programme
- Roses
  - red spider mite
  - Onfarm trails from 2007 onwards.
  - upscaling to more than 60 ha at various altitudes; more anticipated
- Herbs: thrips
- Future plans: Tomato & white fly, pansetalia & shore fly, up-scaling crops, acreage, outdoor crops
- Training of staff and management
- Public – private partnerships

Vegetable production & consumption in Kenya

- Background:
  - Vegetable consumption in the Nairobi metropolitan region is low.
  - negative impact on the nutritional condition of the population, and on the production by smallholders.
- Objectives with regards to consumption and production:
  - Analyze the reasons for low levels
  - Determine the potentials
  - Define strategies to stimulate
Market assessment Mexico

- Objectives:
  - Description of the Mexican horticultural sector
  - Analysis of the technological levels and expected developments.
  - SWOT analyses of the Dutch supply industry and export competitiveness, also in comparison to other suppliers.
- Mission coming May
- WUR:
  - Wageningen UR Greenhouse Horticulture
  - LEI

Metropolitan Agriculture

- Objectives
  - China (Wuhan metropolis): Describe the role of agriculture, nature and landscape as park element between the increasing cities in an urban agglomeration and the possibility to use the open space in a metropolitan region for food production.
  - Africa (Addis Ababa metropolis): Map the effects of urbanization and the abandonment of the rural area population regarding food security. Deliver policy recommendations towards development cooperation.

Energy saving in greenhouses in Norway (Veksthus)

- Exchange knowledge between research, extension service and practice between Norway – The Netherlands
- Research on energy saving:
  - Make use natural light: energy saving greenhouse concepts
  - Make use of light quality: LED lighting, spectral selective greenhouse coverings
  - Improve pest management by modern light and temperature regimes

Wageningen UR Glastuinbouw
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