Wageningen UR Greenhouse Horticulture

www.glastuinbouw.wur.nl

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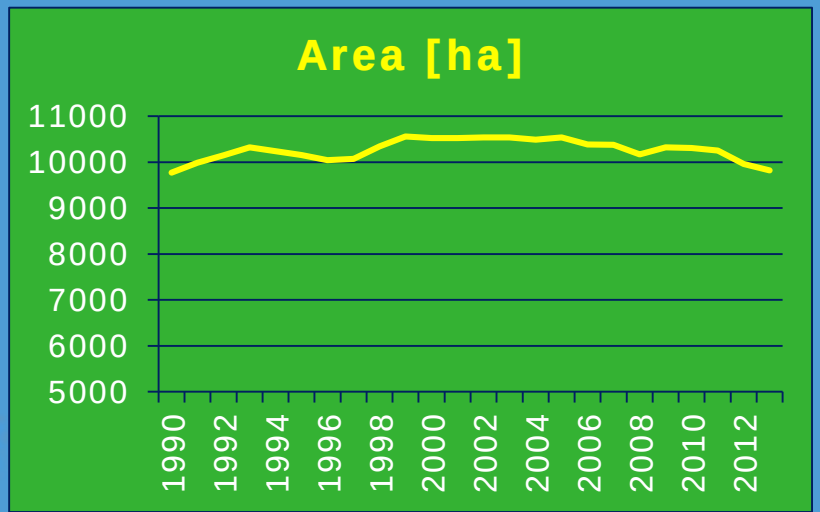
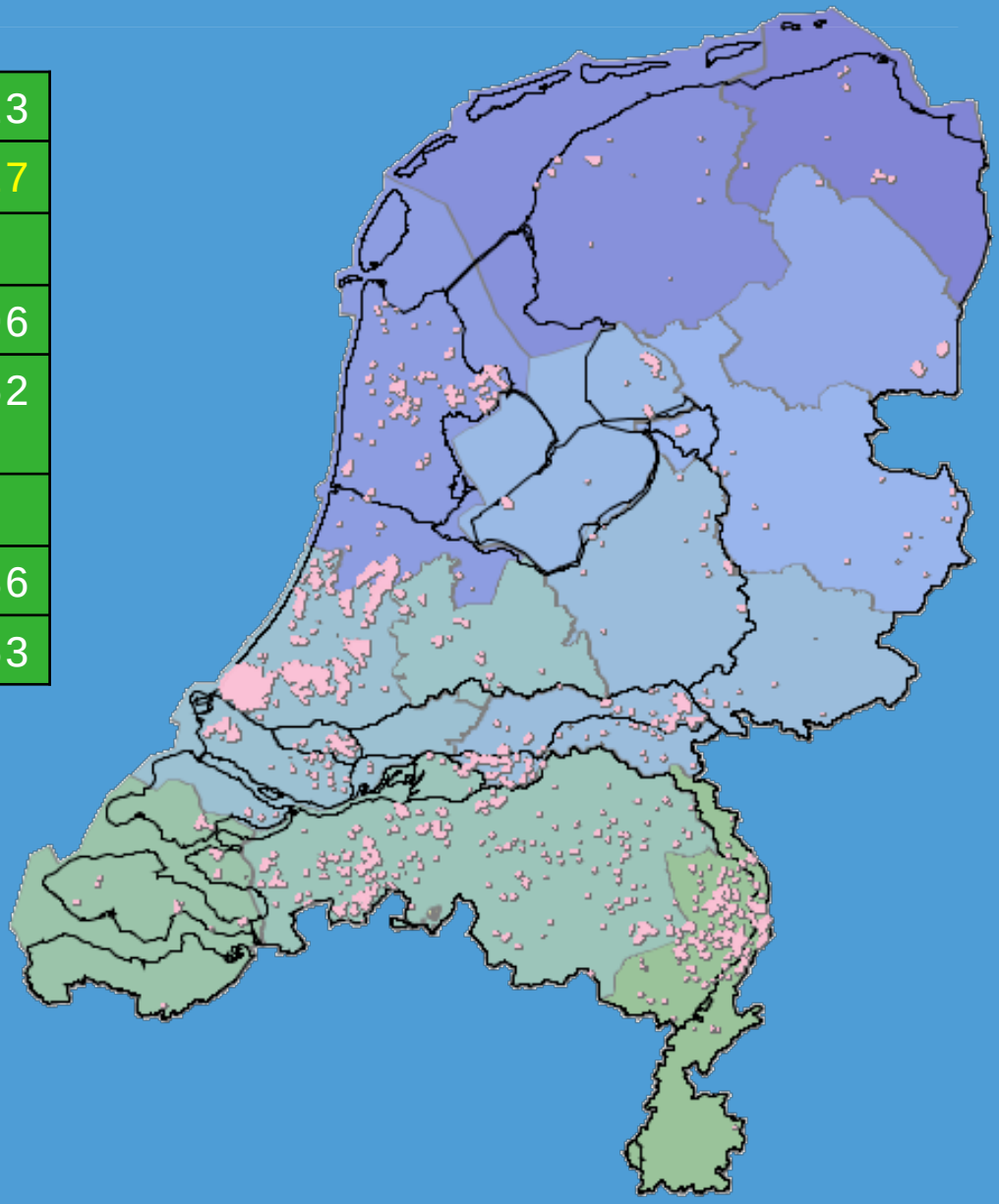
Greenhouses in The Netherlands

	2013
Total area (ha)	9.817
Ornamentals	
Floriculture	4.396
Arboriculture (trees, shrubs, woody plants)	1.352
Food	
Vegetables	4.886
Fruit	53





Greenhouse Horticulture: Vegetables

Greenhouse Horticulture: Cut Flowers

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Greenhouse Horticulture: Potplants

High priority issues in Dutch Horticulture

- Economic viability
- Added value
- Resource use efficiency
    - Energy
    - Water & nutrients
    - Crop protection
    - Land use
- Food safety & food security
- Human Capital development
- Internationalisation

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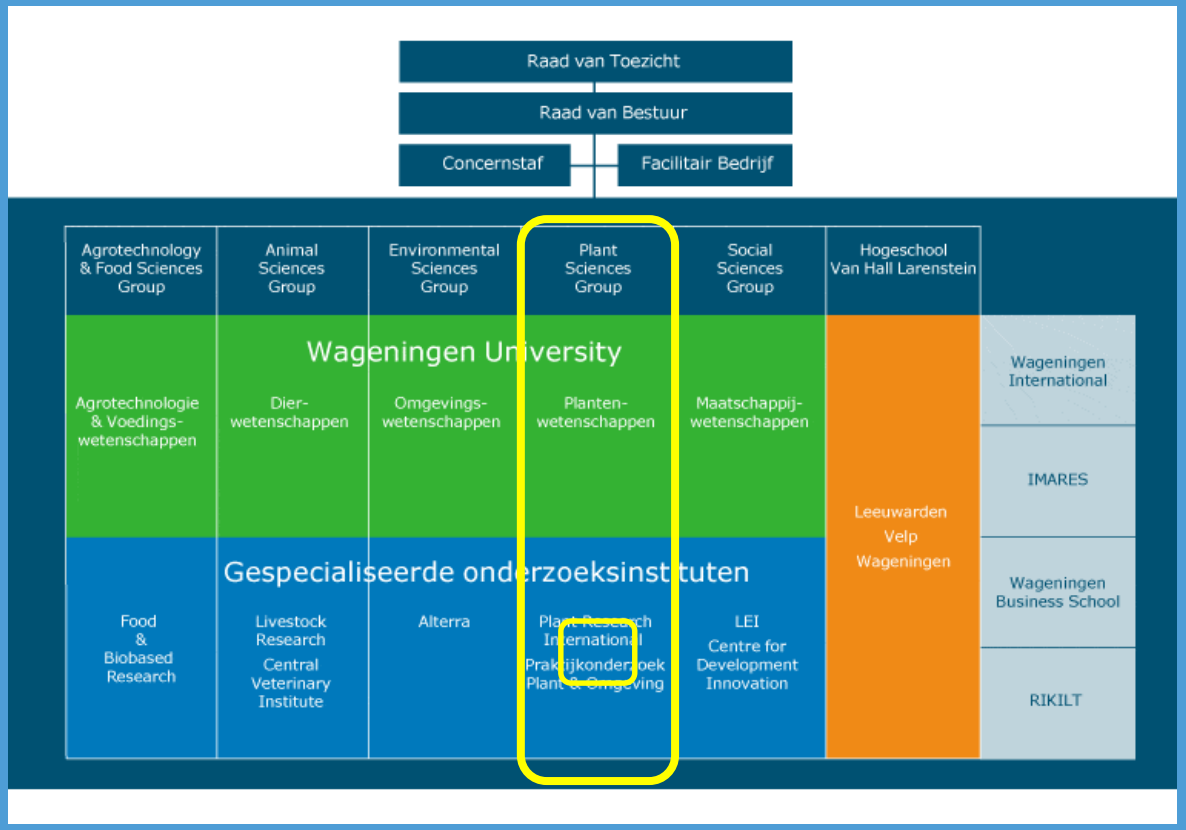

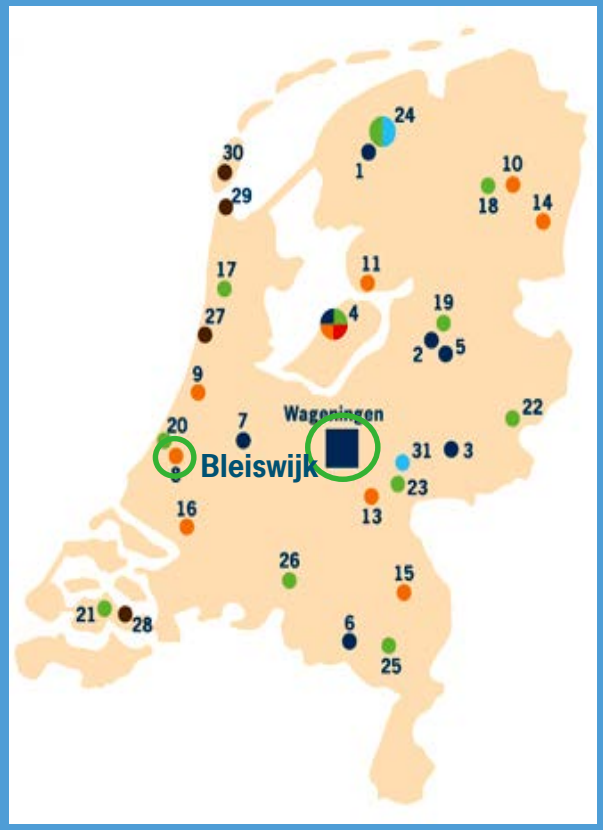

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Wageningen UR Greenhouse Horticulture

- Part of Wageningen University & Research
- Mission: Initiate and stimulate innovations for a sustainable greenhouse sector
- Strategic and applied research
- Multidisciplinary, integrated approach
- Contract research
- ±80 researchers ; >90 greenhouse compartments
- Two locations: Bleiswijk (main facilities) and Wageningen




Location: Bleiswijk

- >90 greenhouse compartments
  - normal ventilation, cooling, complete airco
  - artificial light
  - soil, subtrates, tables
  - Insect breeding
- Crop protection laboratories
- Test facility taste of products
- Innovation and Demonstration Centres: Energy, Water, LED, Taste

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Location Wageningen

- 35% staff
- Laboratories (Vision, robotics, light measurements/ material development)

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Wageningen UR Greenhouse Horticulture

Energy and climate

Water and emissions

Advanced systems

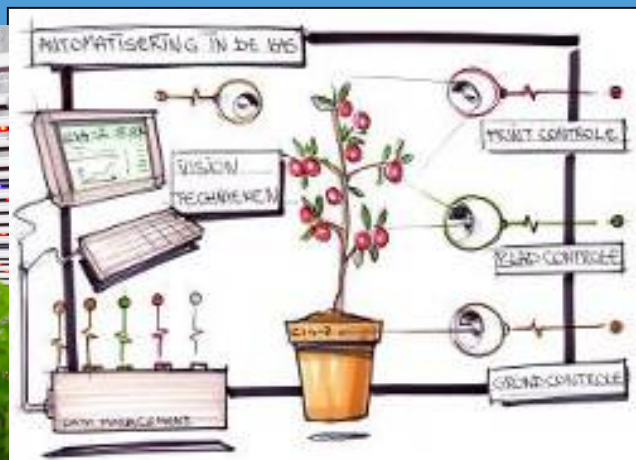
Sustainable crop protection

Quality of crop and product

Added value crops

Climate and energy *

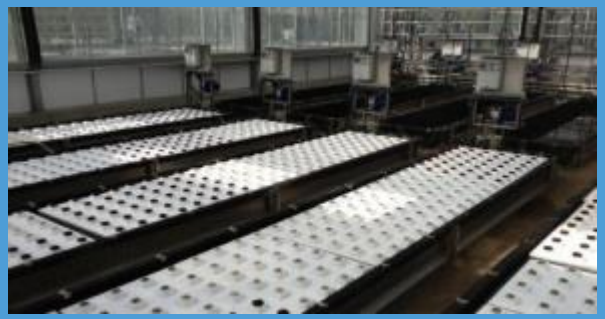
- Energy efficient/ producing greenhouses *
- Energy efficiënt cropping strategies
- High transparent and diffuse covering materials (Anti Reflex, Micro V)
- (Crop) model based control
- Light (eg. LED)



Water, nutrients & emission *

- Emission free greenhouses *
- Watersaving greenhouses (Gulf Region)
- Sensor development and Decision Support System for irrigation semi-arid area's
- Possibilities of algae production
- Emission reduction soil grown crops
- Alternative substrates

Alternative growth systems: on water



Sustainable crop protection

Resilient, robust en suppressive

- Integrated pest management
- Disease resilient soils and substrates
- Induced resistance against pests
- Fungi against insects
- Reduced emission of pesticides

Quality of crop & product *

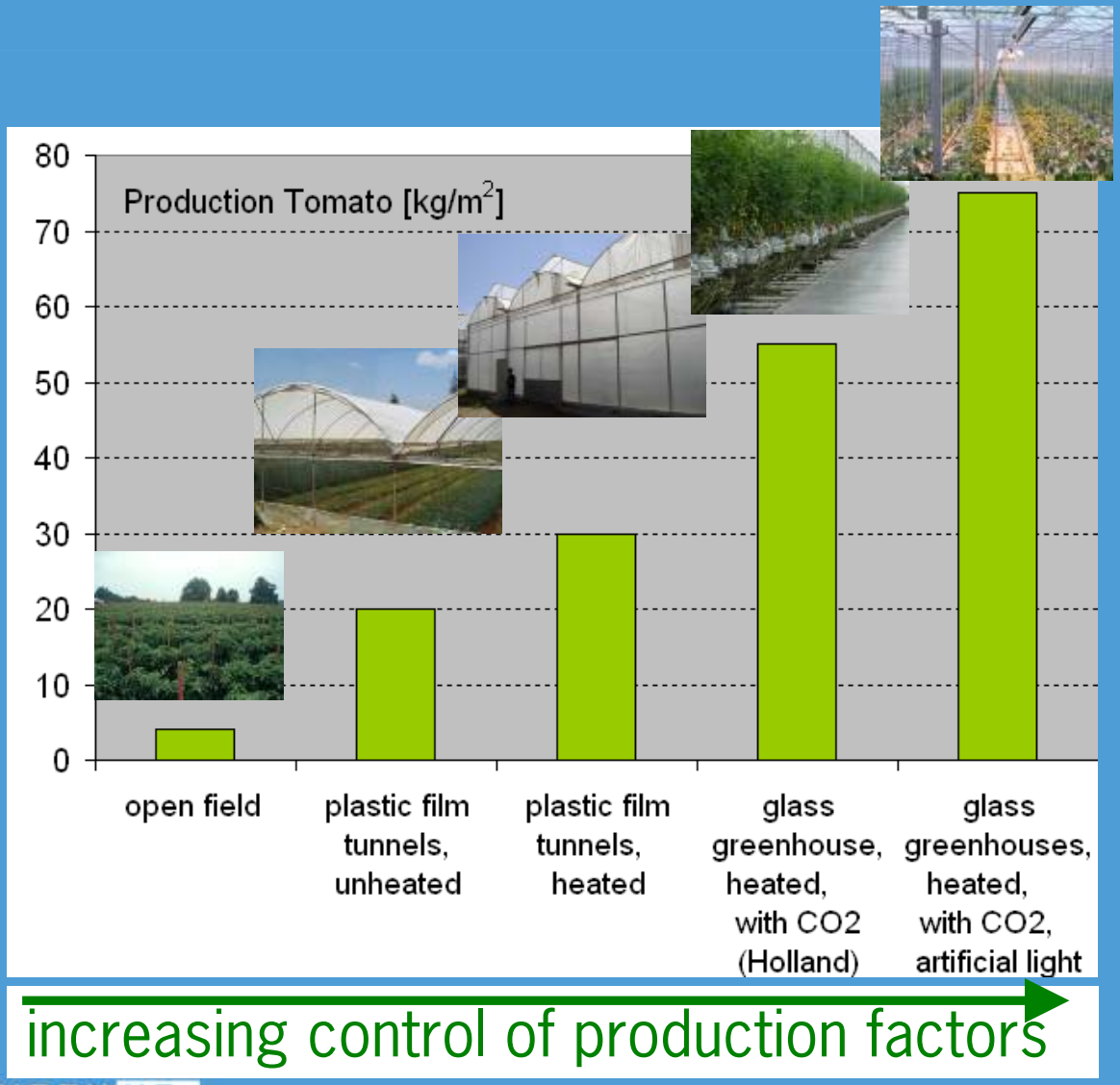
- Quality control by cultivation techniques
- Crop growth models
- Post harvest quality
- Taste/ Healthy components *
- Greenhouse as Pharmacy






KAS ALS APOTHEEK


The advantages of protected horticulture



‘New’ Crops from (Dutch) Greenhouses

Vanilla, Black Pepper, Wasabi and maybe more?

Filip van Noort

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Why new crops?

- Growers need new ‘earning crops’
- Production problems (Vanille) - climate, diseases, etc.
- Quality problems– (black pepper, tropical fruit (taste)
- ‘Greening’-> Natural ingrediënts (Vanille, Indigo)
- Sustainable (Re-use water, fertilization, geothermal heat)

Greenhouse?

- Protected growth
  - More grip on growth
  - Easier IPM
- Year round
- Mechanize and automate
  - Better working conditions

Suitable crops?

- Questions from the market or growers
- ‘Problems’ in other countries
- Fresh market
- Not to easy
- Yearround demand, high price
- Better production then outside
- Grip on growth (trees!)
- Not ‘too’ much light

Goal Vanilla

- Develop vanilla cultivation and curing
    - Flowering
    - Cultivation system
    - Curing
- ‘build’ a business-case

Partners

- Five entrepeneurs
- Dr. B. Gravendeel, lector Biodiversity Naturalis and University of Leiden
- R. van Vugt, Hortus botanicus Leiden

Approach (basic)

- Literature
- ‘translation’ knowledge to greenhouse cultivation
- Import green pods for ‘curing’
- Learning trip (la Reunion, 2015)
- Learn to pollinate
- ‘create’ information for business-case

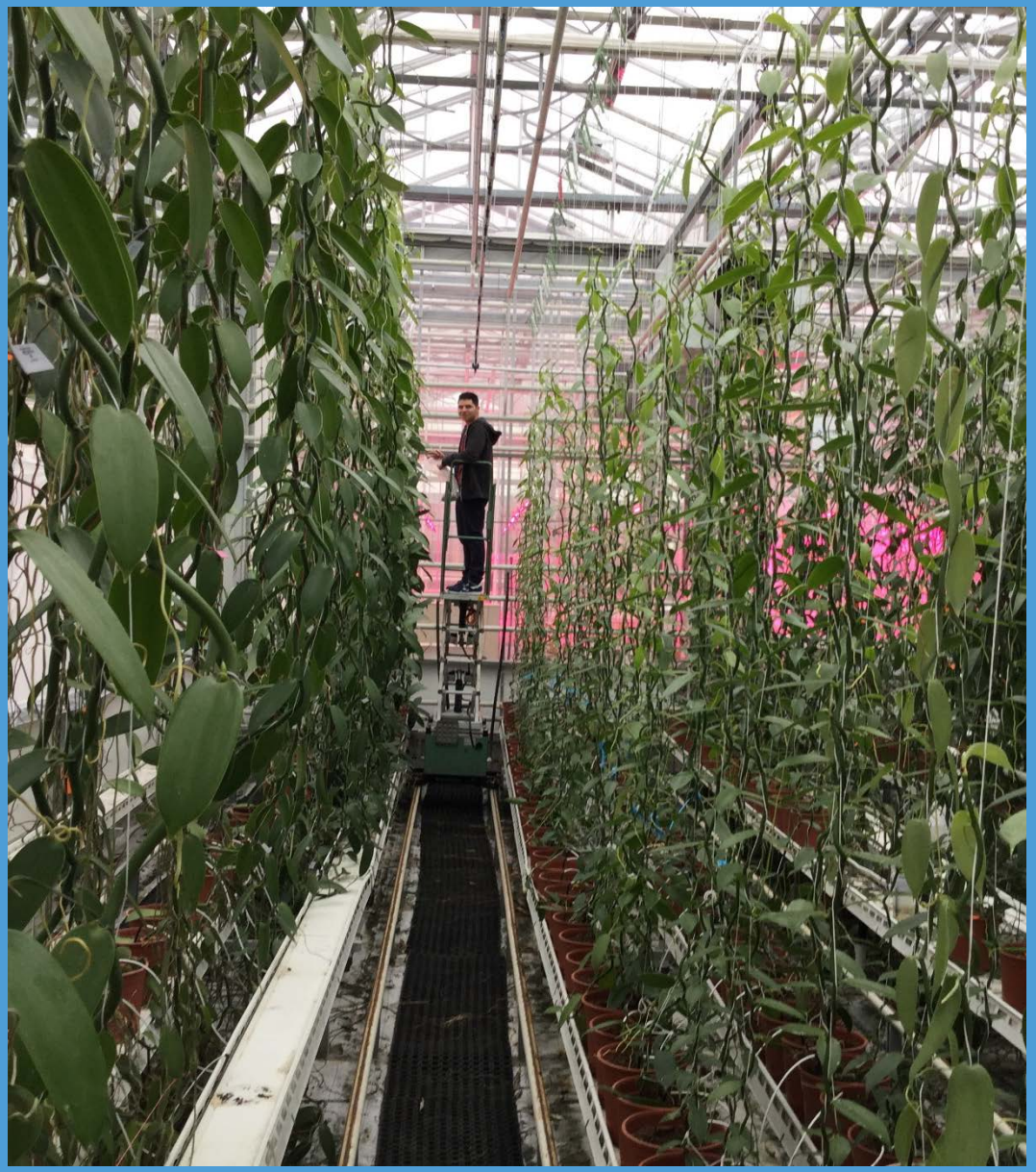
Greenhouse

Greenhouse climate adjusted to plant needs and amount of light

- Light, moving screens, artificial?
- Temperature
- Humidity
- Water and fertilization
- CO2

Growing system

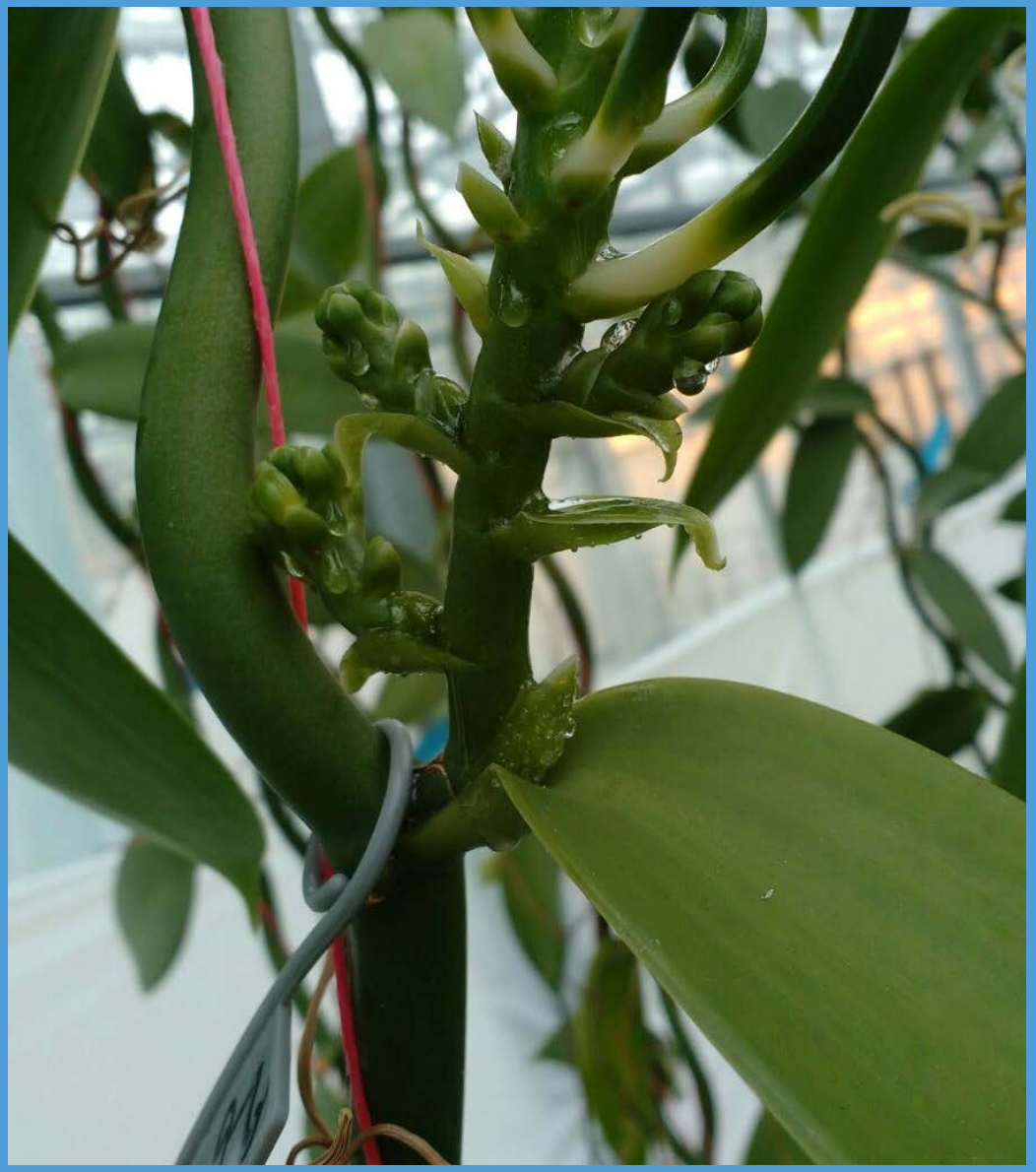
- 3 systems
  - Short looping
  - Long looping (4 m)
  - High wire
- Space for (re-) rooting
- Single plants in case of fusarium
- Re-use of water and fertilization



Flowering

Flowering: always combination of at least two changing parameters:

- Light
- Temperature
- Water availability
- Crop handling (?) (pruning, looping)



‘Achieved’

- flowering on two locations in 2 or 3 years
- Good curing method planifolia
- Quality is good/enough
- Lot of new contacts (growers, media and customers)

Situation now

- Start harvesting
- Amounts of pods in combination with weight
- Complete business-case

Dutch Vanilla Growers will (hopefully) start a business soon

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‘future goals and wishes’,

- Year-round flowering
- Good, ‘named’ and fusarium free varieties
- Good quality for normal prices
- Influence on taste

Black Pepper

- Goal
  - Develop cultivation and processing of black pepper in a greenhouse
  - Make business case
- **Partners**
  - Huijbrechts groep, Intertaste, Duijvestijn Tomaten, Vastar Holland Eminent en Gemeente Rotterdam

Cultivation

- Pre-research 2015-2016
  - developing growth protocol
- Testing growth protocol 2017-2018
  - good varieties, quality, ingredients-levels, growing system

Wasabi

- Goal
  - Develop cultivation and processing of Wasabi in a greenhouse
  - Make business case

Approach

- Literature
- ‘translation’ knowledge to greenhouse cultivation
- Learning trip (Japan, 2017)
- Ideas for cultivation
- Make trial
- ‘create’ information for business-case

Thank you for your attention

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