10 jaar

Teelt de grond uit

10 years soilless cultivation of outdoor crops

ERIAFF conference

30 June 2017

Workshop 4.1 - Sustainable water use in soilless cultivation

Janjo de Haan

Matthijs Blind

WAGENINGEN UNIVERSITY & RESEARCH

PROEFTUIN ZWAAGDIJK

VOLLEGRONDS groentenet.com

TOPSECTOR TUINBOUW & UITGANGSMATERIALEN

Origin of program with entrepreneurs

Outdoor Horticulture in the Netherlands

Vegetables and herbs

Fruits

Flower bulbs

Tree nursery crops and flowers

Demands from the market

Labour

Soil quality and availability of land

Regulations

Public Private Partnership soilless cultivation of outdoor crops

- Objective

Develop and implement profitable new cropping systems in outdoor horticulture which can comply with EU guidelines on water quality (ND, WFD)

- Since 2007/2009
- Research, growers, advisors, suppliers, government
  - More than 70 companies involved
- Financed by government, growers and others

WAGENINGEN UNIVERSITY & RESEARCH

PROEFTUIN ZWAAGDIJK

VOLLEGRONDS groentenet.com

TOPSECTOR TUINBOUW & UITGANGSMATERIALEN

Cropping systems

Deep flow system		 
Substrate based systems	Containers or crates on the ground	   
	Gullies above the ground	
	Substrate beds or gullies in the soil	  

Apple Junami® in gullies

	ton/ha	#fruits /meter	size (mm)
2011	3	9	59.3
2012	10	15	78.2
2013	52	86	76.8
2014	53	86	77.3
2015	61	115	74.3
2016	62	116	74.1
Average practice	57	100	75

Apple growing in gullies

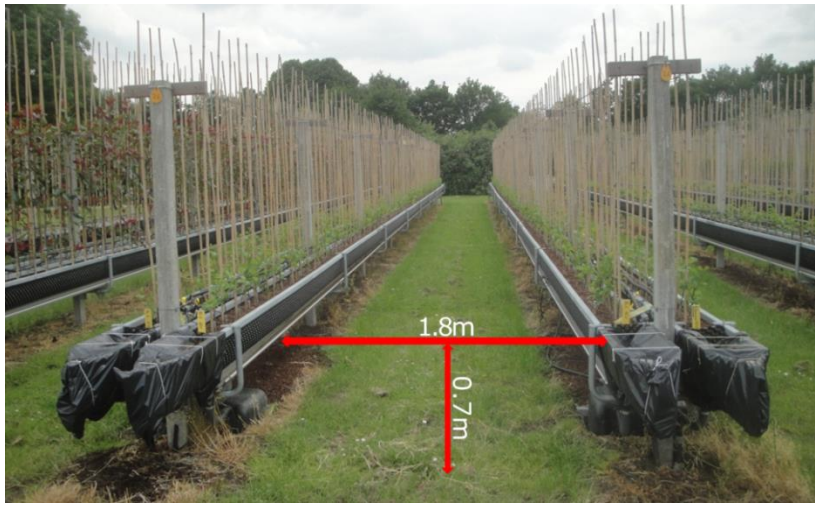
- Nitrogen emissions: <25 kg N/ha/yr
- Prevention build up nematode Pratylenchus penetrans:

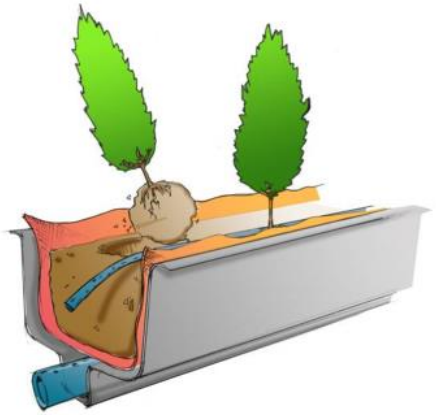
number/100ml	Start april11	aug12	nov14	dec16
Standard	0	7	6	1
PHC-strategy	0	0	0	0

- Pratylenchus penetrans control by inundating gullies:

number/100ml	start	5 weeks may/june	8 weeks okt/nov
Pilot Heijnen `14	36	19	1

Tree nursery crops in gullies and containers





Comparison growth soilless cropping with cropping in the soil




Leafy vegetables and herbs on deep flow systems (1)

- Start with NFT systems
  - Interruptions in water supply, sensitive to hard wind
- Continuing with DFT
  - Robust
  - Automatization and mechanization
- In two years
  - Systems at growers farms
  - Floater Cultivation Systems

Leafy vegetables and herbs on deep flow systems (2)

- Microdochium in lettuce
  - Crop cover best management practice
- Aeration and water circulation important
  - Development of Airlift (Botman)
- >10 growers with a cropping system
  - 100 tot 30.000 m^2
  - Development of specific varieties, techniques and marketing channels
  - Increase growers interest (Fusarium)

Leafy vegetables on DFT: "convertible greenhouse"

- No problems with Microdochium (no rain)
- Fast growing crop in winter (heating, light)
- Better quality in summer (opening greenhouse)
- Optimization cropping:
  - Balance temperature and light intensity in greenhouse
  - No cooling of the water
  - Inoculation with useful micro-organisms gives yield increase
- Not yet profitable

Intensive winter cropping with SON-T and LED light

- SON-T: 210 µmol/m²/s
- LED: 140 µmol/m²/s

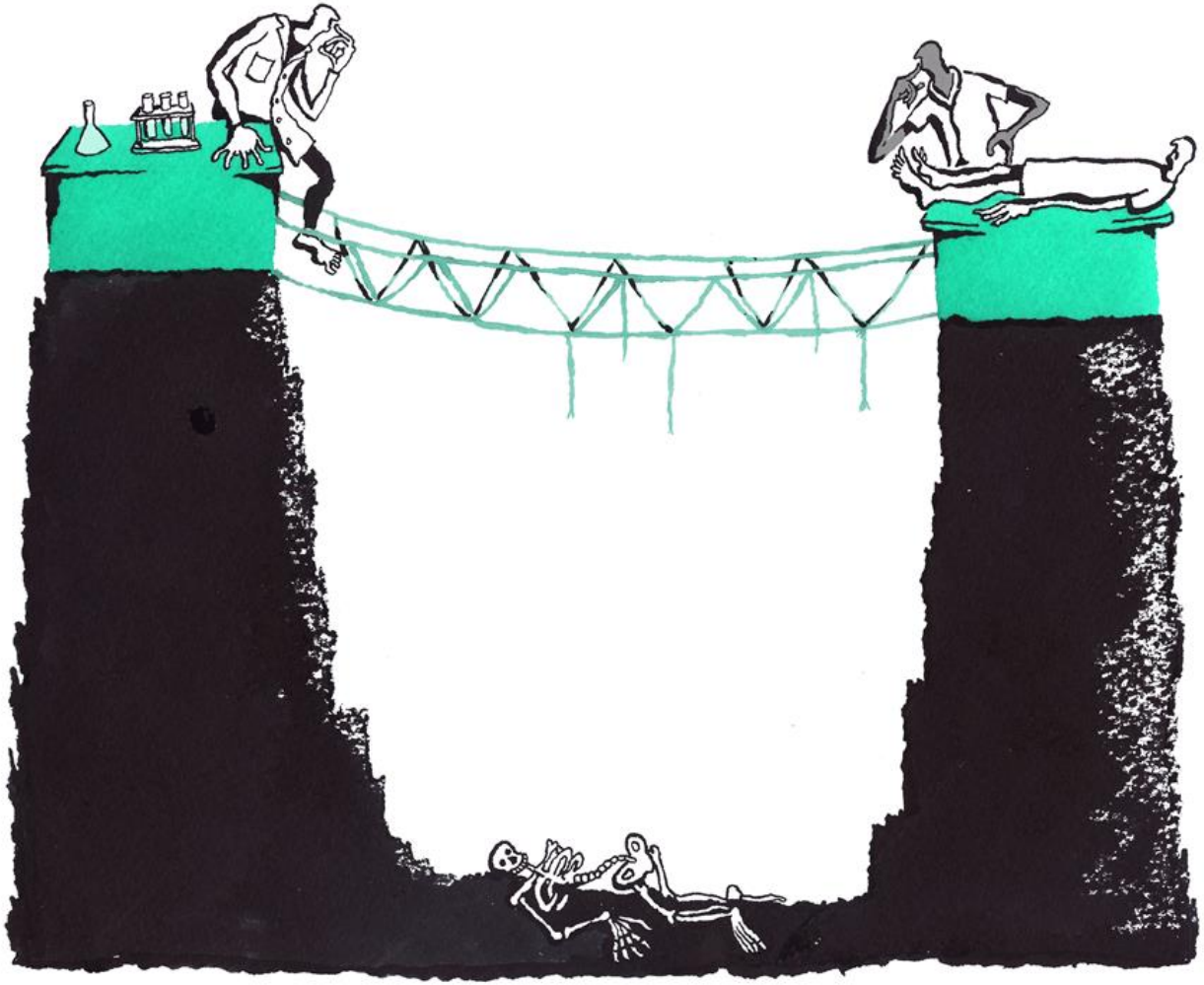
- Good yield level
- Cost price estimation 250 g
  - LED: 30-47 cents
  - Reference: 28-52 cents

Leek on DFT-system

- Clean product
- Sufficient length white stem
- 3 croppings a year
- Yield up to 300 ton/ha/year


Prei zandvrij
www.prei.nl
Preiteler Robert Sandee uit Kamperland.
Nieuwe preiteelt-methode, uniek in Nederland!
Deze malse prei is duurzaam en schoon op water geteeld, voor een gezond product en een schone bodem.
Artikelnummer 4691236. Inhoud: zandvrije prei, 3 stuks. Klasse 1, herkomst: Nederland.
verspartners.nl
8 718421 872367
Vers Partners

Innovation gap



Illustratie
B. Mellor

The innovation task: Further system development

- Apple and blue berry: half way first cropping period
  - Vitality after 10-12 year
  - Development same system for pear
  - Effect “dry cropping” blue berries on production and emission
- Flower bulbs
  - Soilless bulb production
  - Steamable substrate
- Production chain DFT systems
  - Plant nursery – cropping logistics – marketing

The innovation task: Further development and optimization

- Robustness of system
  - Continuous production of high quality
  - Prevention of pests and diseases
- Profitability and sustainability
  - Reduction of costs – creation of added value
  - Closing systems
  - Reduction of energy use
- Upscaling: automatization and mechanization
  - Planting – cropping – harvest - processing

The gap must be bridged after 2017

- Social importance soilless cropping
  - Sustainability
  - Economic development
- Several enthusiastic growers have similar questions
  - Facilitate growers in development of their own systems needed
  - Financially and with knowledge

→ Continuation of support of innovation is needed!

Thank you for your attention!

www.teeltdegronduit.nl

janjo.dehaan@wur.nl

matthijsblind@proeftuinzwaagdijk.nl

WAGENINGEN UNIVERSITY & RESEARCH

PROEFTUIN ZWAAGDIJK

VOLLEGRONDS groentenet.com

TOPSECTOR TUINBOUW & UITGANGSMATERIALEN