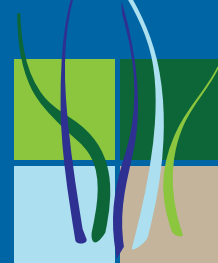


# Teeltdegronduit



## Soilless cultivation of vegetables in The Netherlands to reduce nitrogen emissions

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### Background

- Open field production to meet requirements of EU Water Framework Directive and EU Nitrates Directive (Nitrate emissions)
- Market requirements: low pesticide residues, constant quality and delivery
- Crops: lettuce, leek and cauliflower

### Design

Analysis of current cropping systems (technical, environmental, societal and legal) + requirements = different concepts

### Experimental farms small scale testing

Repeating process of testing and redesign/engineering to meet the requirements. Deep flow systems show potential to fulfil the requirements. Main advantages: minimal use of substrate, robustness (large buffer), good fertilization and temperature control.



### Perspective

Systems were assessed on all sustainability aspects. Planet: nutrient and pesticide emissions, energy use, climate change, land and water use, biodiversity and waste. People: labour and food quality. Profit: profitability, financial risks and competitiveness.

### Indication of perspective

	Lettuce		Leek	
	Open field	Deep flow	Open field	Deep flow
Number of plants per ha/yr x 1000	168	720	160-200	2500-3200
Yield Number of plants per ha x1000	111	684		
Yield ton/ha/year			30-50	200-300

- Much stadier crop production
- Lower loss of plants
- Cleaner products without soil or organic contamination
- Independent of weather conditions (planting, harvesting or crop treatments)
- Reuse of water during two growing seasons on experimental scale showed no adverse effect on crop
- Discharge of water because of accumulation of salts or precipitation deficits will be needed. Investigations are running in order to minimize nutrient emissions too surface- and groundwater.

### Implementation in practice

Implementation of the systems has already started



### Conclusions

Soilless cultivation of open field vegetables:

- Technically feasible
- Expected to be profitable
- Meet market requirements and higher yields
- Potentially reduces nitrate en plant protection emissions, level of reduction is still under investigation